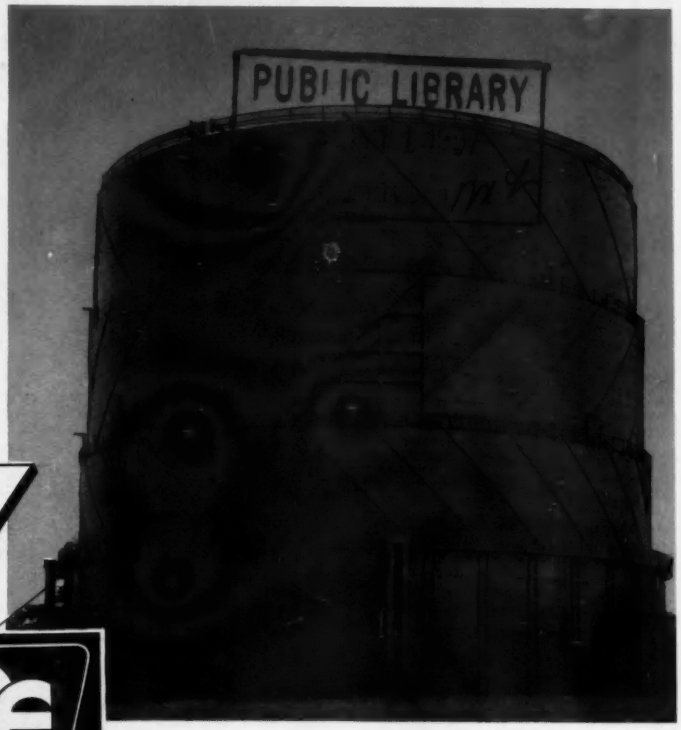
1957 TECHNOLOGY DEPT.

Gas Journal

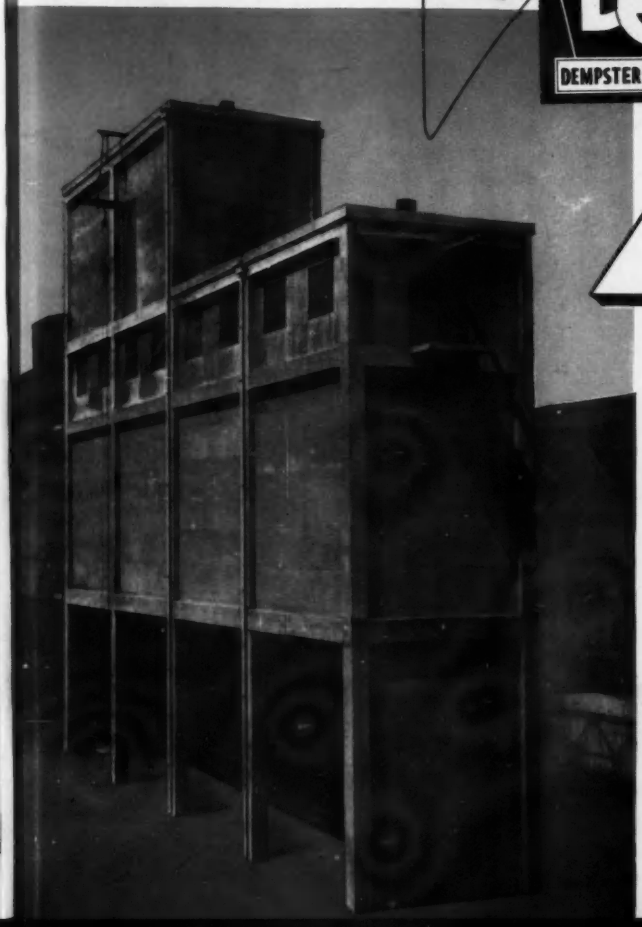
VOL. 291. 109th YEAR. LONDON, AUGUST 21, 1957 No. 4910 PRICE 1/6

2 RECENT CONTRACTS



GASHOLDER. 3 lift, spirally guided, 1½ million cubic feet capacity, prepared for a fourth lift.

DE
DEMPSTER·ELLAND

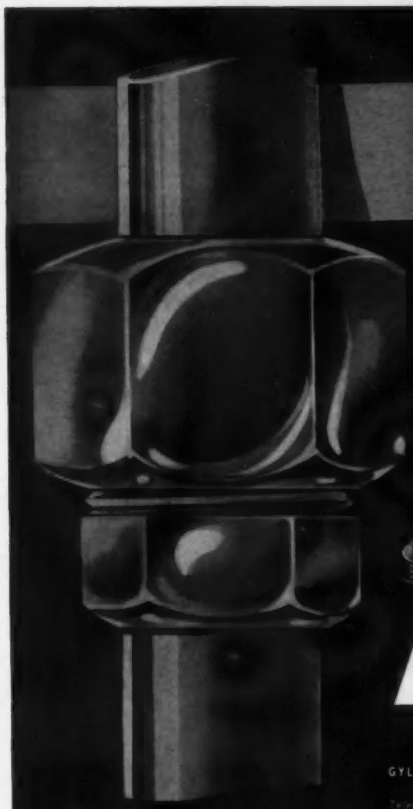


COKE HANDLING PLANT.

Coke Handling, Screening and Storage Plant, from a photograph taken whilst under construction.

by ROBERT DEMPSTER AND SONS LTD., ELLAND, YORKS.

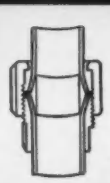
Other manufactures include: PURIFIERS · CONDENSERS & STATIC WASHERS · COAL & OXIDE HANDLING PLANTS and HORIZONTAL CARBONISING PLANT



A really permanent joint

You can put implicit trust in a SECUREX joint—it's quickly fixed (two minutes per joint, on average) and, once in position, resists pressure, side strain and temperature variations throughout the life of the installation. SECUREX Solderless Compression Joints are precision built in many different sizes—full particulars gladly sent on request.

SECUREX
SOLDERLESS COMPRESSION JOINTS



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(BARE END SHAFT)
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ASK FOR PUBLICATION No. P/79

THE BRYAN DONKIN COMPANY LIMITED
CHESTERFIELD — LONDON

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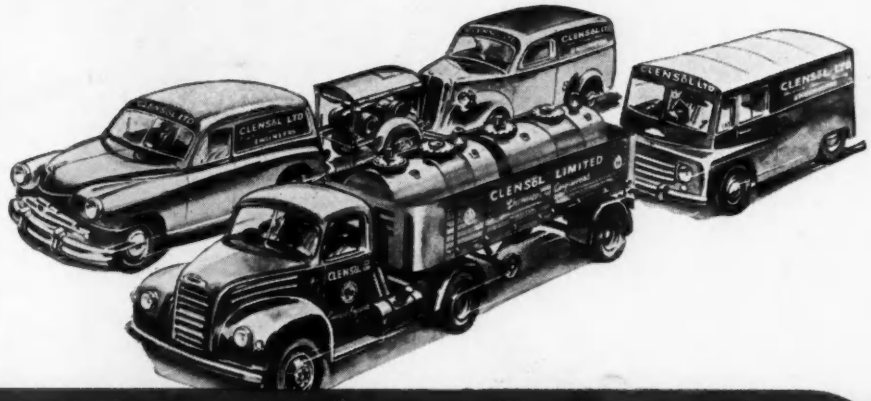

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CLENSŌL specialist services are available "round-the-clock" for the speedy and efficient removal of deposits from all types of plant, pipework, supply and discharge mains etc., including "in situ" removal of corrosion products, mill scale from new plant, following installation. All work is carried out by fully qualified and mobile teams of operatives working under the supervision of Area Engineers.

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Contractors to The Admiralty—War Dept.—Air Ministry—Ministry of Supply, Works & Transport —U.K. Atomic Energy Commission—Central Electricity Authority—Gas, Coal & Hospital Boards—Local and Water Authorities—the leading shipping, oil and industrial firms.
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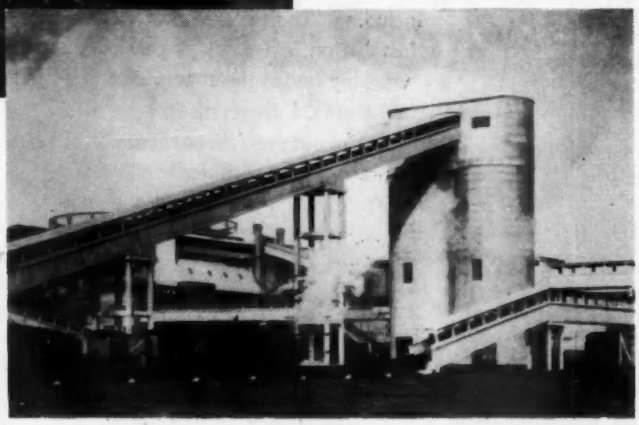
A

GOOD PRACTICE

Here is good conveying practice — a well and evenly loaded belt running straight on the conveyor, with negligible spillage.

It is based on the equally good practice of choosing BTR Conveyor Belting. This conveyor, and all the conveyors, at the vast Tottenham Gas Works Extension are equipped with BTR Belting — spliced and made endless on site by the BTR Mobile Conveyor Belt service.



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CONVEYOR BELTING THROUGHOUT . . . . .

BTR

Engineers in Rubber

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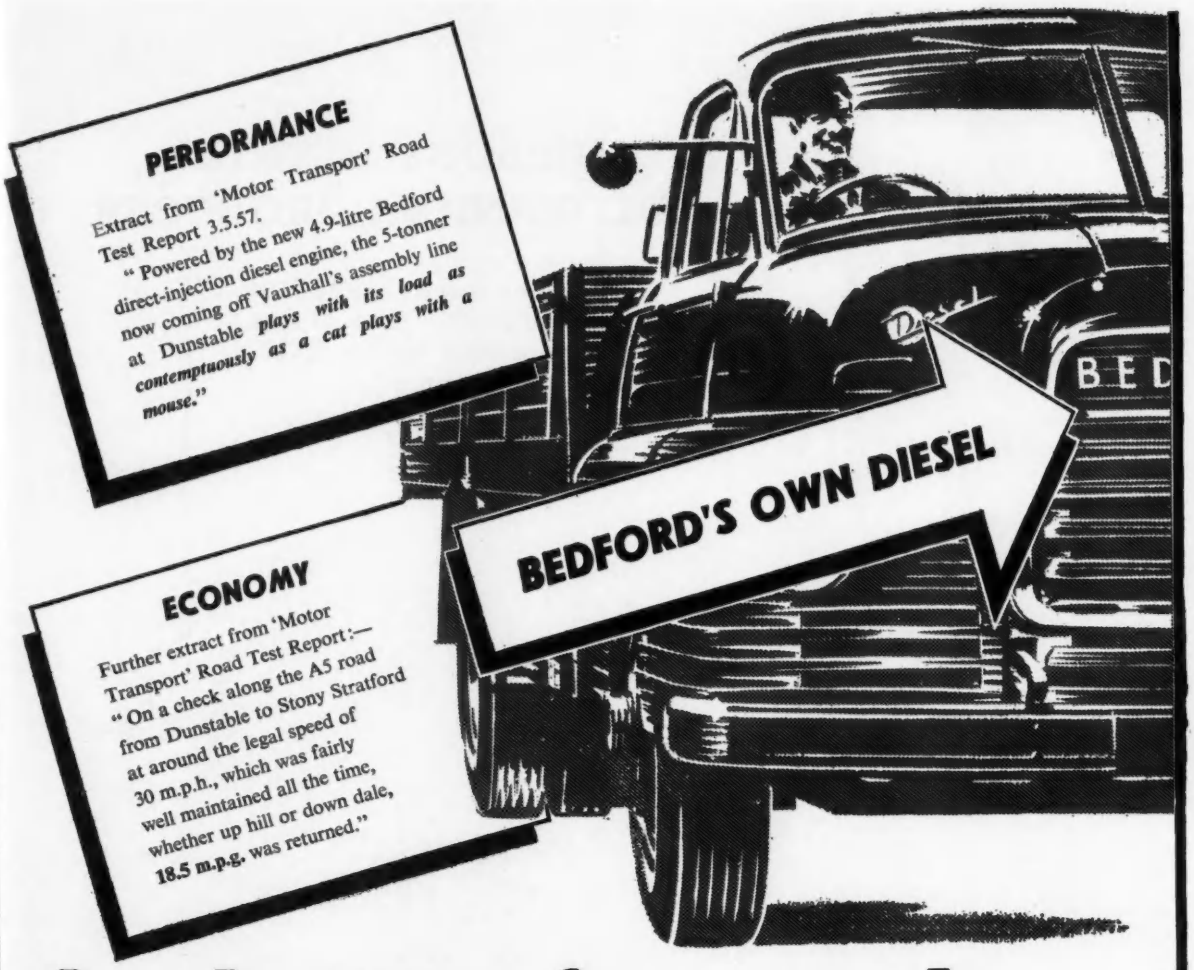

PERFORMANCE
Extract from 'Motor Transport' Road Test Report 3.5.57.
" Powered by the new 4.9-litre Bedford direct-injection diesel engine, the 5-tonner now coming off Vauxhall's assembly line at Dunstable plays with its load as contemptuously as a cat plays with a mouse."
BEDFORD'S OWN DIESEL
ECONOMY
Further extract from 'Motor Transport' Road Test Report:—
" On a check along the A5 road from Dunstable to Stony Stratford at around the legal speed of 30 m.p.h., which was fairly well maintained all the time, whether up hill or down dale, 18.5 m.p.g. was returned."

A glutton for work...

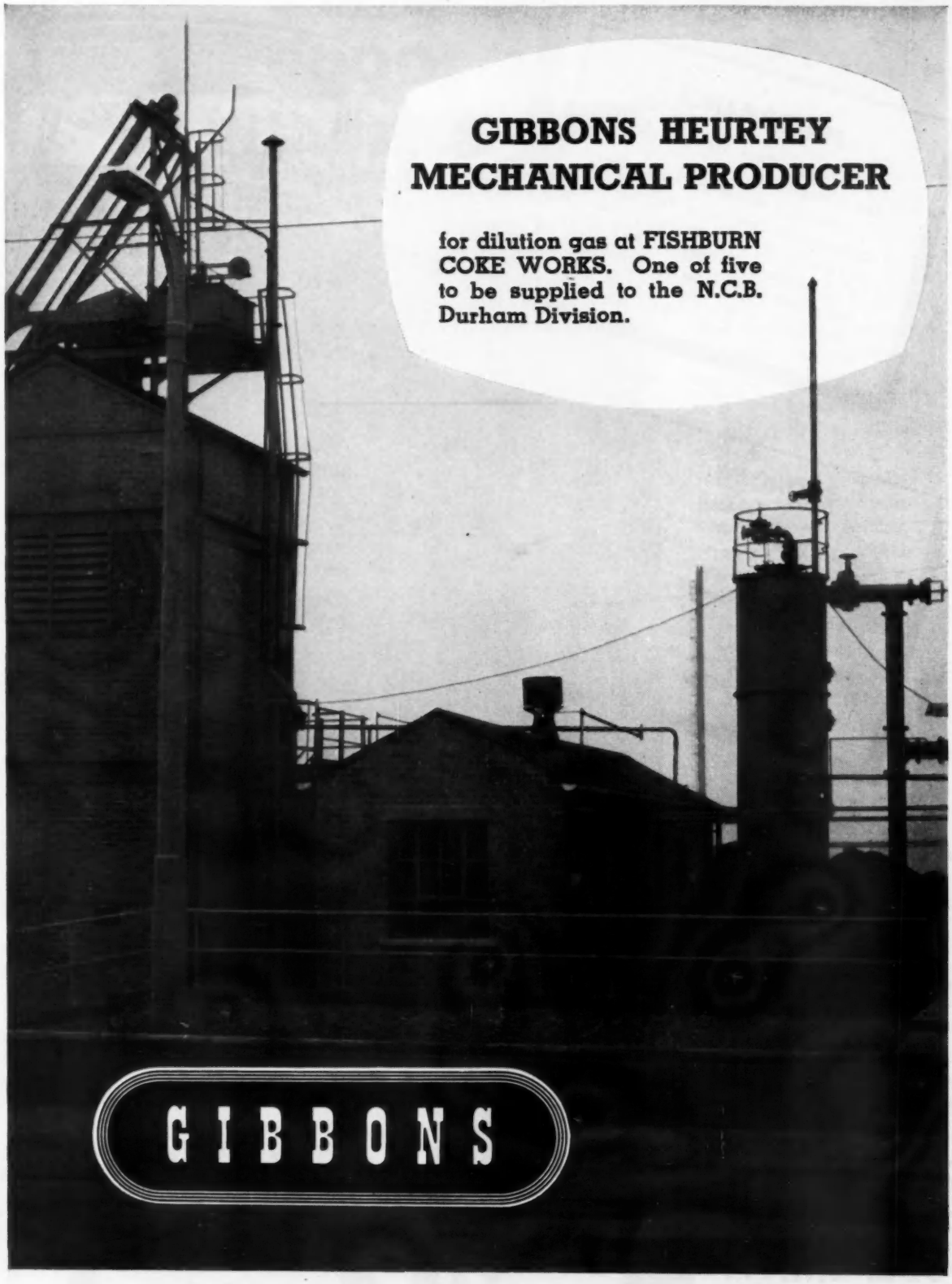
BUT FRUGAL WITH FUEL

The figures show that power has not been sacrificed to economy — or achieved at the expense of high fuel consumption. The Bedford diesel is designed to maintain high average speeds on today's trunk roads. Its economy does not end with its low fuel consumption, either. It has long-life features normally found only in the highest-priced diesels. Its practical, accessible design makes for low upkeep costs. And it is built at Dunstable, Britain's newest plant, where up-to-the-minute production methods increase precision and bring down costs.

This is the diesel unit for the new range of Bedford normal and forward control 4-ton, 5-ton and 6-ton trucks. It is the most modern 6-cylinder direct-injection diesel on the market and top value for money. *Full particulars from your local Bedford dealer, or write for literature to Vauxhall Motors Ltd., Luton, Beds.*

CUT THE COST OF POWER WITH...

Bedford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MECHANICAL PRODUCER
for dilution gas at FISHBURN COKE WORKS. One of five to be supplied to the N.C.B. Durham Division.
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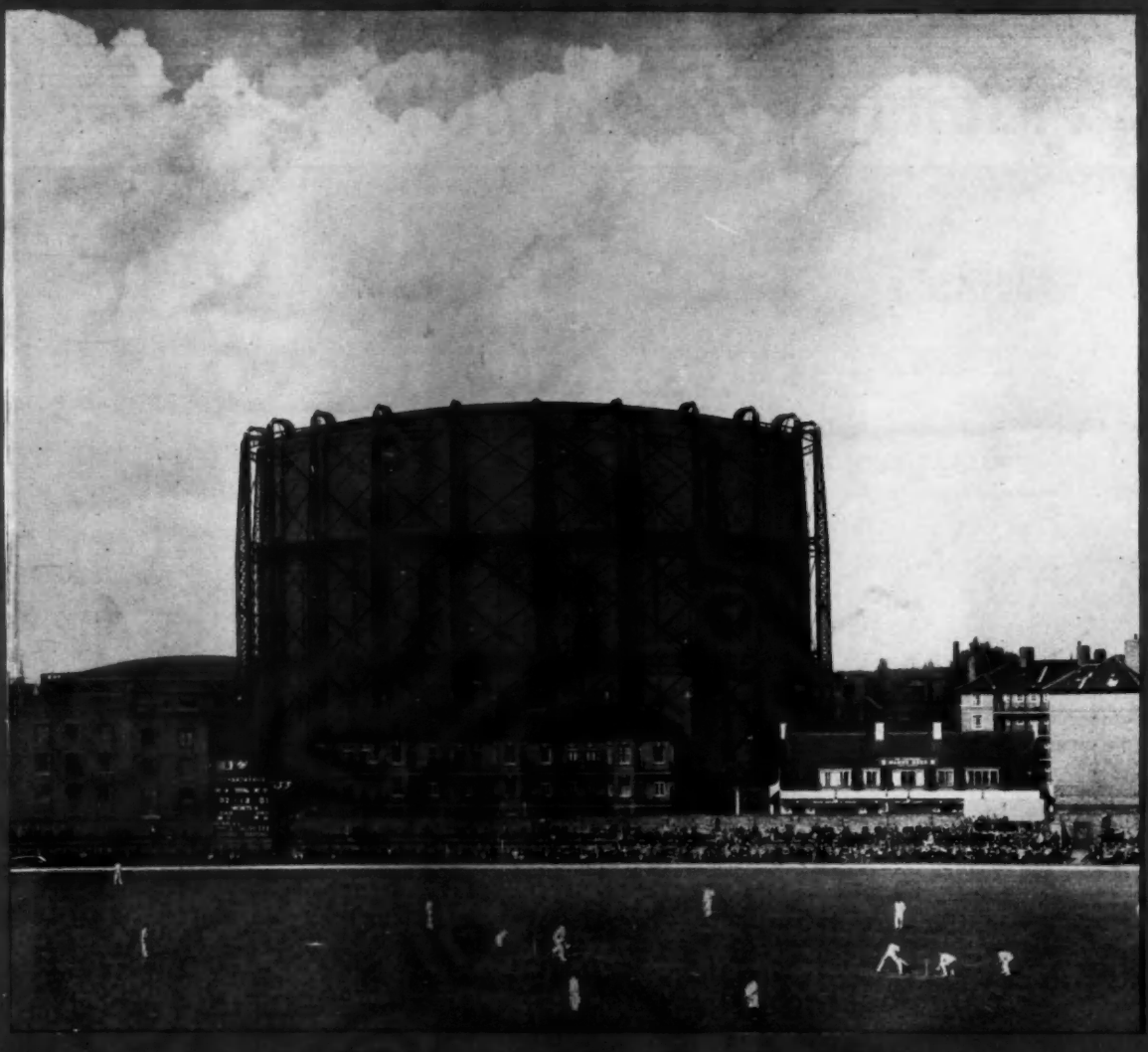


CRAFTSMANSHIP AT ITS BEST
ON AND OFF THE FIELD

The 6 million Frame Guided Gasholder at Kennington Oval, was reconstructed following war damage, by Clayton's of Leeds : in the background . . . the new two million Spiral Guided holder, also erected by Clayton's to replace another war-damaged Holder.

Gasholders of all Types by

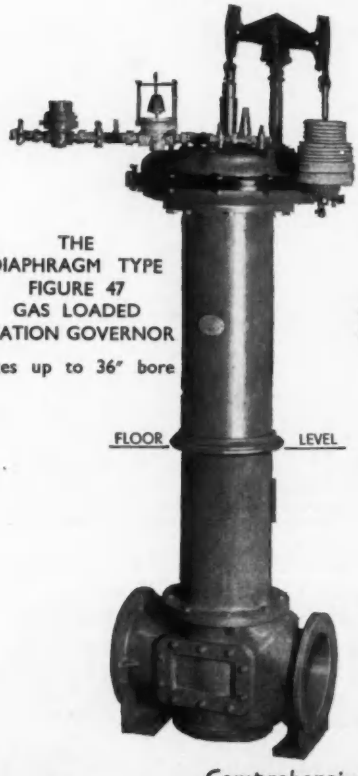
CLAYTON SON & CO. LTD.
HUNSLET LEEDS YORKSHIRE

Peebles

FOR ALL SIZES AND TYPES OF GOVERNORS

DIAPHRAGM CONTROL VALVES, AUTOMATIC BY-PASS VALVES, METER PROTECTION VALVES, HOLDER FILLING VALVES, THERMO RELAY VALVES, CUT-OFF VALVES, GAS METERS

SINGLE-BEAT VALVE GOVERNOR FIGURE 98 (BALANCED) PATTERN



THE DIAPHRAGM TYPE FIGURE 47 GAS LOADED STATION GOVERNOR

Sizes up to 36" bore

THE WEIGHT-LOADED FIGURE 109 DOUBLE-BEAT VALVE GOVERNOR

Comprehensive list of products on application

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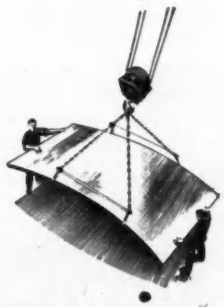
WHESSOE

PURIFIERS AT JERSEY

This set of five welded mild steel overhead purifier boxes were built by Whessoe for the Jersey Gas Light Co. Ltd.
The plant which was installed in a former retort-house, has a capacity of 3 million cubic feet per day.
The boxes each contain two 2′ 6″ deep layers of oxide.
Special attention was given to the structural design of the plant to provide easy and unobstructed access with ample headroom to the bottom discharge chutes and oxide elevator within the confines of the building. The photograph shows the resulting clean design and illustrates the advantages of welded construction.



WHESSOE LIMITED, Darlington, Co. Durham Telephone: Darlington 5315
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W96/CHWR

Cut your costs with

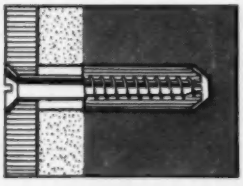
21 RAWLPLUG FIXING DEVICES

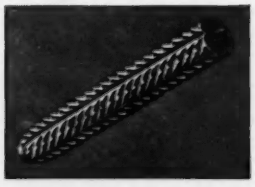
FOR SPEEDY FIXING IN ANY MATERIAL

No more trouble or costly delay because the material was 'difficult'! Whether it's concrete or plastic, breeze or sheet metal, cavity brick or lath and plaster, there's a Rawlplug Fixing Device that makes firm screw or bolt fixings quickly, easily and economically. The speedy answer to every fixing problem is one or other of the 21 different types of Rawlplug Fixing Devices. Write for illustrated brochure.

Screw Fixings

Use the famous RAWLPLUG for neat, firm fixings in brick, stone, etc. All sizes up to ¾" diameter Coach Screws. Rawlplugs are waterproof and unaffected by climatic conditions.

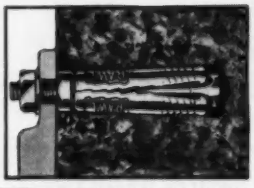


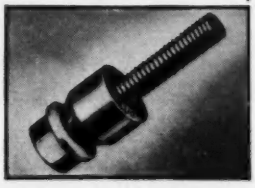


Rawlplug WHITE BRONZE PLUGS are specially suitable when the fixing is subject to very high temperatures, such as the outer brick coverings of furnaces. Use also for under-water fixtures.

Bolt Fixings

For bolting down machines, use RAWLBOLTS, a dry fixing that grips by expansion. No cold chiselling, no waiting for cement to harden. Sizes up to 1" bolt diameter.

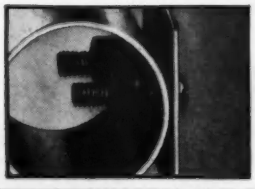


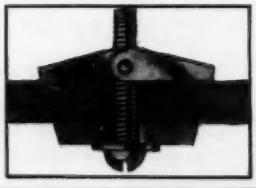


Use Rawlplug BOLT ANCHORS for bolting down in extremely wet or corrosive situations. Caulking completely seals the anchorage. Use also for anchoring Diesel Generators, Power Hammers, etc.

Cavity Fixings

Screwed up from the front the amazing RAWLNUT forms its own rivet head behind the material—airtight, watertight, vibration-proof, squeak-proof! For all thin or hollow materials.





For ceilings of lath and plaster, plasterboard, etc., use Rawlplug SPRING TOGGLES. The inserted Toggle springs open behind the material, spreading the load over a wide area.

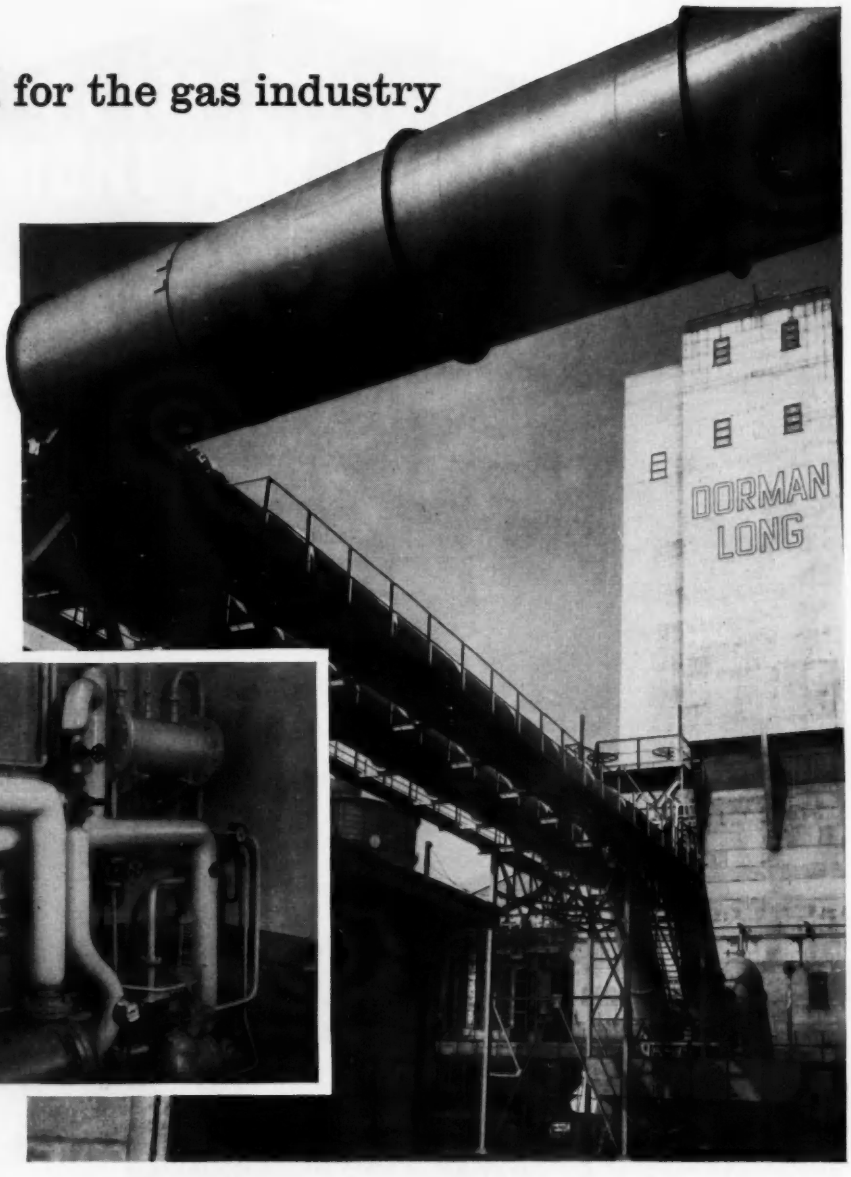
USED BY THE MILLION THROUGHOUT INDUSTRY

RAWLPLUG FIXING DEVICES

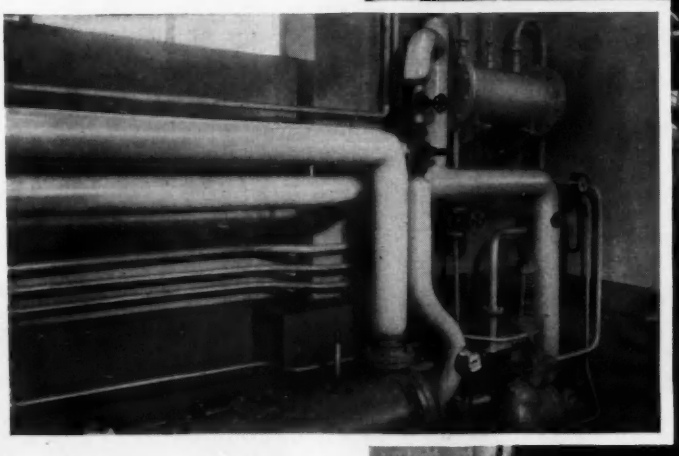
21 *different types of fixing devices for Speed and Strength*

Made by THE RAWLPLUG CO. LTD., CROMWELL ROAD, LONDON, S.W.7
The World's largest Manufacturers of Fixing Devices.

PIPEWORK for the gas industry



This photograph shows an 84-inch diameter Welded Steel Blast Furnace Gas Main to Coke Ovens at the Dorman Long Plant at South Bank, Middlesbrough, welded by the United Kingdom Construction & Engineering Co. Ltd., for the main contractors, Simon-Carves Limited.



The Calorifier Room, showing Heat Exchanger, Condensate Receiver, Lift Trap and Pressure Relief Valve, with Interconnecting Pipework, installed for Dorman Long by the United Kingdom Construction & Engineering Co. Ltd., to the order of Simon-Carves Ltd.

These photographs show just one example of the many large-scale projects entrusted to the capable hands of the United Kingdom Construction & Engineering Co. Ltd., who have years of experience in this sphere. Their technical experts are at your service to submit tenders to your specifications for projects in any part of the country.

UK

The United Kingdom Construction & Engineering Company Limited are also contractors for Mainlaying, Industrial Pipework and Reinforced Concrete Construction.

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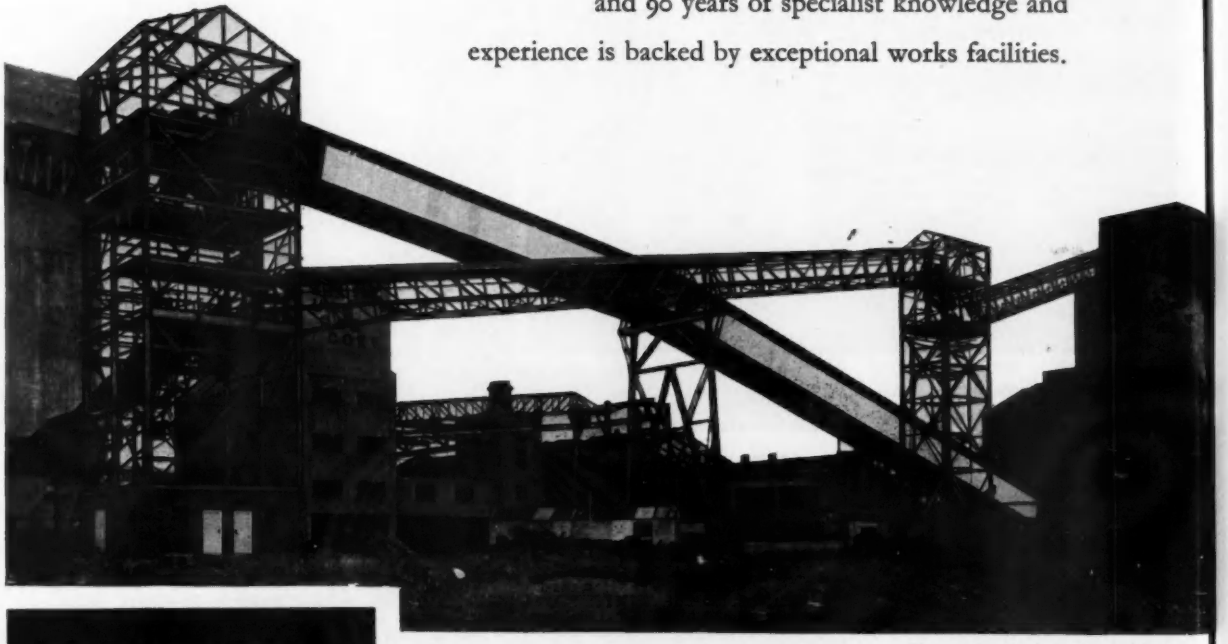
craftsmanship in steel...

Developments now taking place within the Gas Industry are designed to give benefits to industrial and public consumers alike. Long before these developments are complete and the benefits realised, detailed planning is called for in a multitude of ways. Not least is the supply and fabrication of structural steelwork and this has been Walker Bros. contribution to the new gas-making plant at the Walsall Works of the West Midlands Gas Board. We are highly organised to tackle any structural steelwork problem, large or small, and 90 years of specialist knowledge and experience is backed by exceptional works facilities.



Photograph by kind permission of Contractors Woodall-Duckham Construction Co., Ltd.

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LIMITED
Structural Engineers

ESTABLISHED 1867

if it can be built in steel—we can build it

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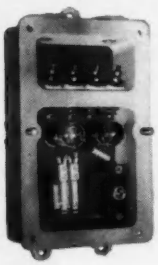
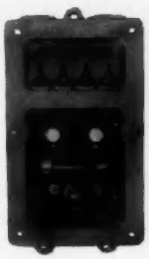
FLAMEPROOF EQUIPMENT FOR INDUSTRIAL USE

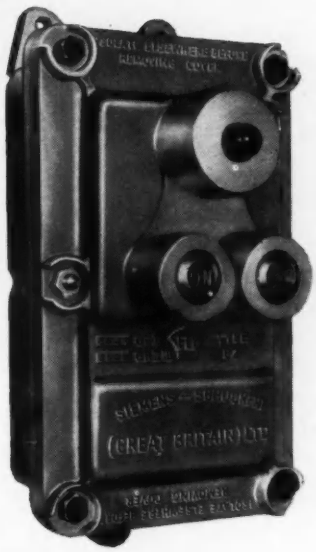
GROUPS I, II, III

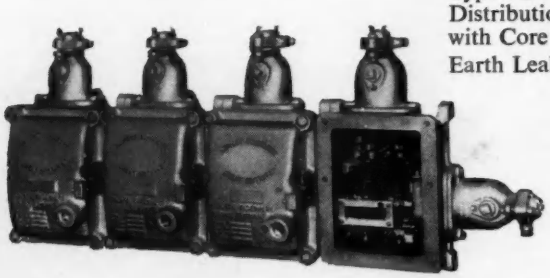


Flame Proof Annunciator Type P.3



Flame Proof Push-button Type P.2





Type FS 15 amp Triple Pole Distribution Board with Core Balance Earth Leakage Protection

Flame Proof Limit Switch

VARIOUS ALTERNATIVE DESIGNS AVAILABLE

Remote Control Switch

Siemens-Schuckert (Great Britain) Ltd

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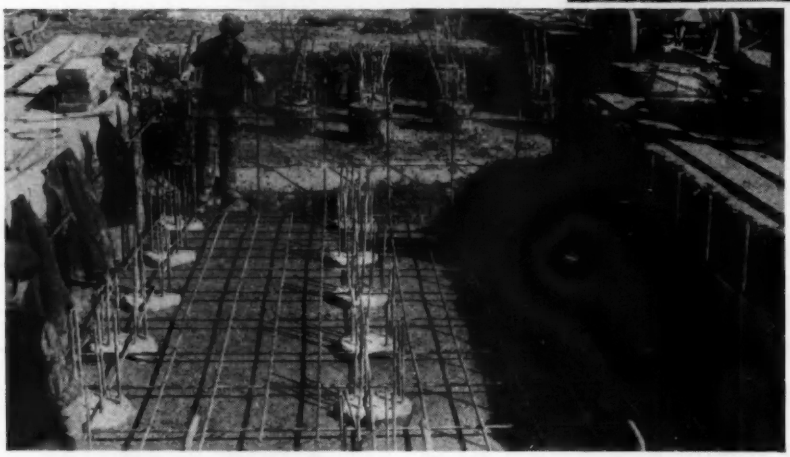
Smee's S.89

BORED PILES FOR THE N.F.U. KNIGHTSBRIDGE SITE



The heavy foundation loading from this building made normal footings for the columns out of the question —a condition frequently obtaining to-day when higher storeys are permitted. Piling was necessary and the close proximity of other buildings, including a Hospital, precluded the use of heavy driving equipment with its accompanying noise and vibration.

Cementation Bored Piles were selected by competitive tender and the foundation work was completed very successfully notwithstanding the difficult ground conditions unexpectedly encountered.

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'BIG WALRUS' Fully Mobile STACKER

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This C & T Stacker is Electric or Diesel operated. When feeding from usual Tipping Lorries, ramps are unnecessary, as opening in extra wide hopper permits direct access from the front at low level. Rubber sealing flaps around hopper opening and steel skirt-plates on belt to reduce spillage to negligible proportions.

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Speed Handling · Reduce Costs!

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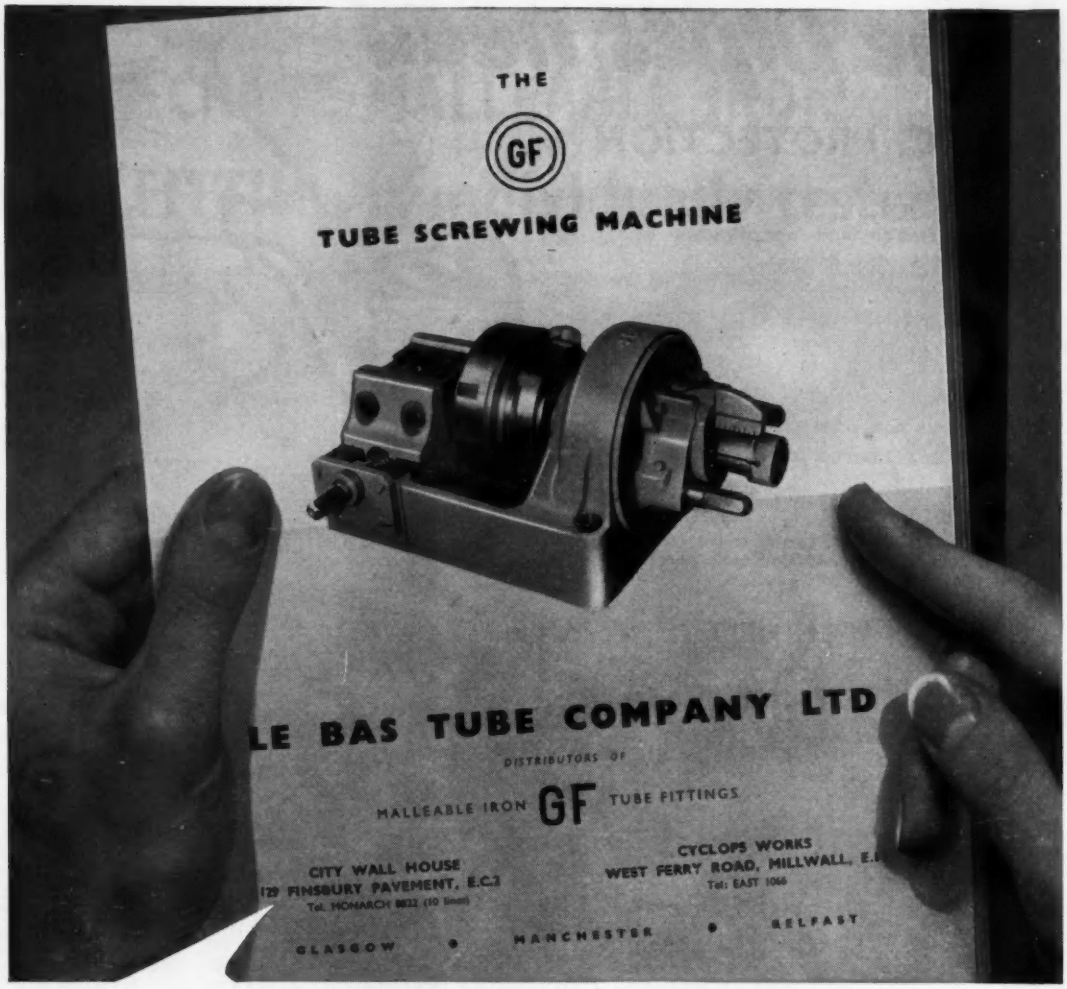
This C & T Junior Bagging Unit designed to handle 1 cwt. Coal Bags, can cope with pieces up to 8" max. size. The unit incorporates Electrically Vibrated Bagging Chutes giving fine control over material being bagged—a footswitch leaving the operators' hand free to hold bag.

Full particulars of these equipments from :

CRONE & TAYLOR (ENGINEERING) LTD.

SUTTON OAK, ST. HELENS, LANCS.
Phone : St. Helens 3283.



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of

- ★ Pipelines and other steel structures
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- ★ External and internal corrosion of oil tankers
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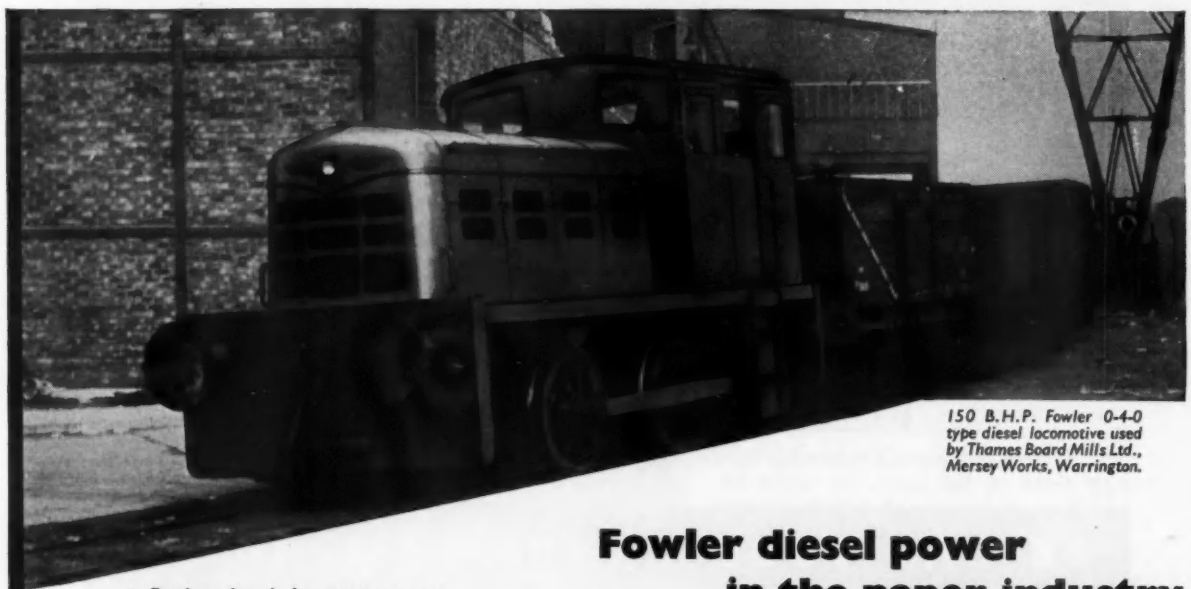

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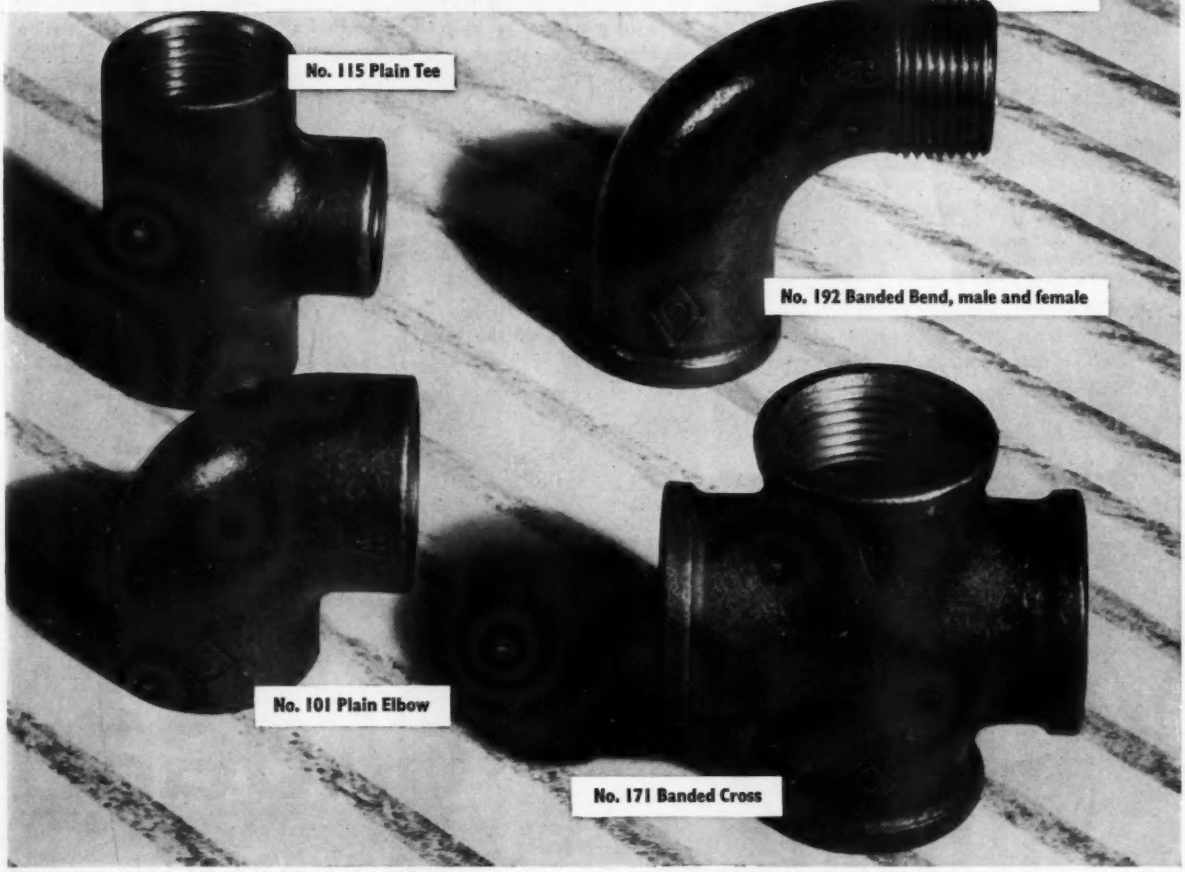

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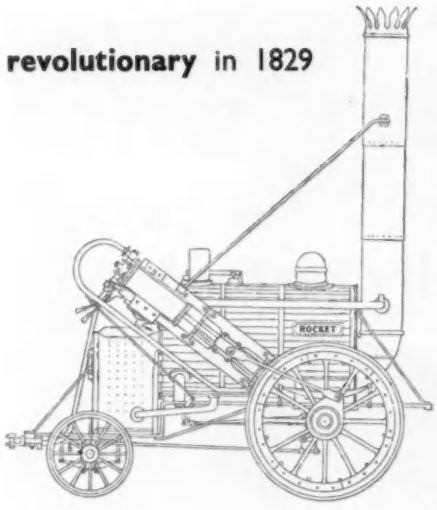

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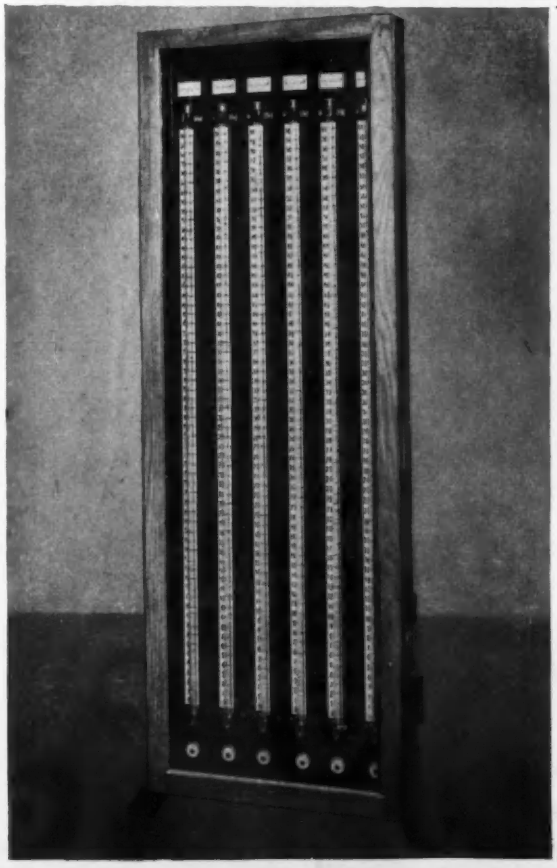

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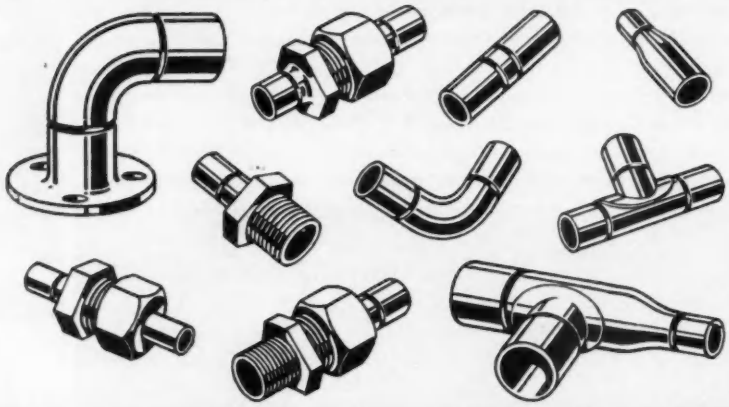

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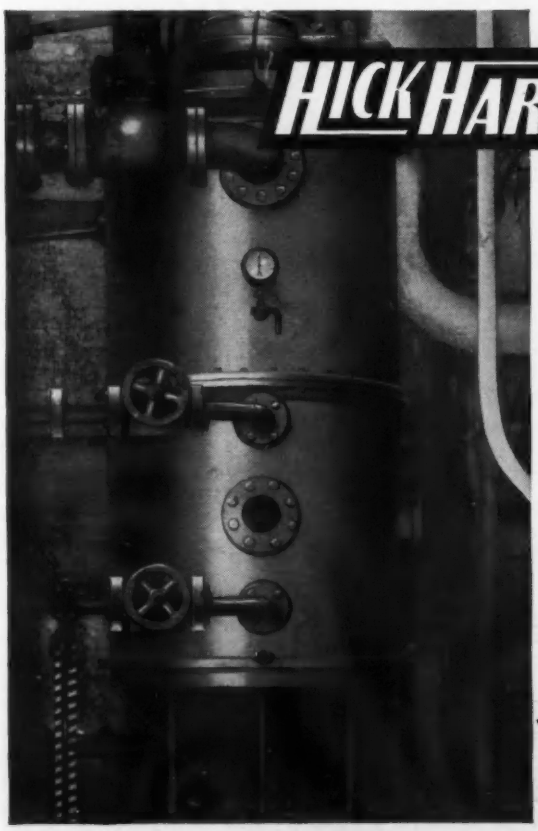

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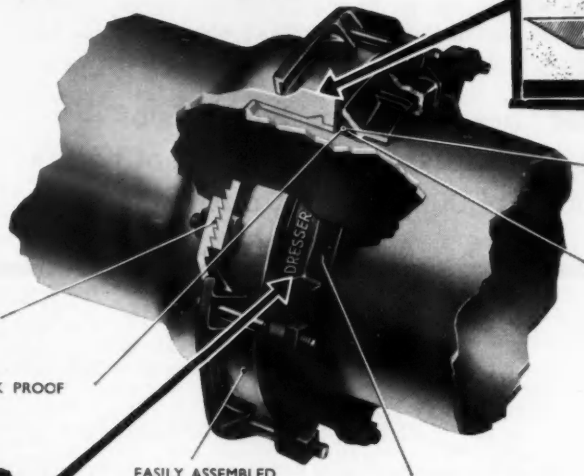

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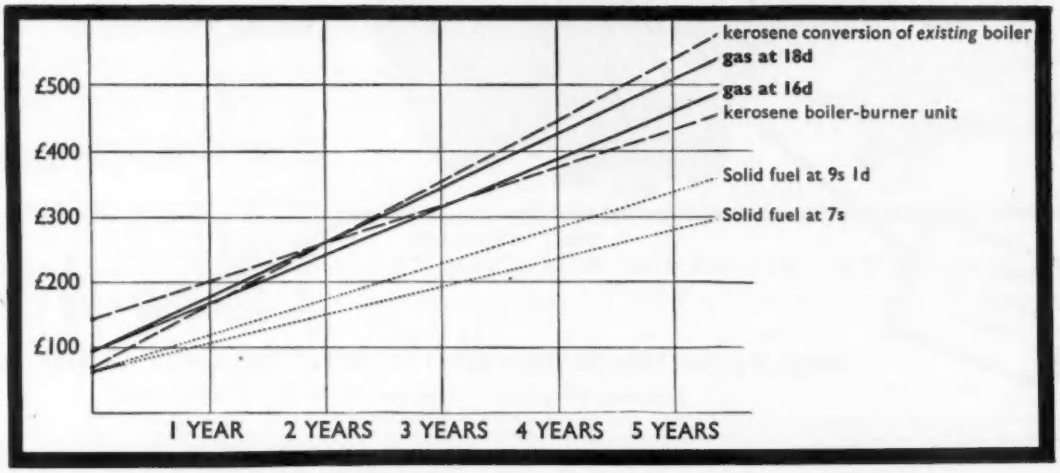

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Installation costs are assumed typical figures, to the nearest £5.

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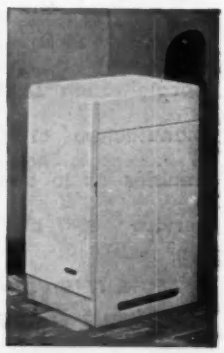

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VOL. 291 NO. 4910 August 21, 1957

109TH YEAR

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VOLUME 291. No. 4910. AUGUST 21, 1957. 109th YEAR

Coal Gasification in the United States

WITH all the developments in the use of natural gas throughout the United States of America interest in the production of gas from coal or coke might well have been lost. This is by no means the case, however, for although the production of gas as such is only absorbing about 5 mill. tons of coal at the moment, a large quantity of coal is being carbonised for the manufacture of metallurgical coke. Some of this coke is being used for the manufacture of water gas, to be carburetted and used to supplement supplies of natural gas at periods of peak demand; or as a source of hydrogen for the manufacture of synthetic ammonia, or as a source of synthesis gas for the methanol and liquid fuel industries.

The future of the gasification of coal is considered to be of the utmost importance in the United States, so much so that in 1952 the President's Materials Policy Commission forecast that by 1975 between 150 and 170 mill. tons of coal would be gasified, of which between 130 and 155 mill. tons would be being used for the manufacture of synthetic liquid fuels. The Commission also forecast a great increase in the production of synthetic ammonia, the production of which has increased sevenfold since 1939 and will probably increase from the present 4.143 mill. tons per year to 6.3 mill. tons by 1975. Of this quantity 80% will be produced by the gasification of 5.2 mill. tons of coal a year. The production of methanol, too, is increasing steadily, and the Commission foresee an increase on the 1952 figure of 170 mill. gal. of synthetic methanol, bringing the total up to 975 mill. gal. per year by 1975; 80% of this will be manufactured as a result of gasifying 3.8 mill. tons of coal.

Developments are taking place in the production of synthesis gas directly from coal, which involve treating it with steam and oxygen. With the reduction in the cost of tonnage oxygen such a process is being studied more seriously in the United States, and pilot plants have been built by both industry and the U.S. Bureau of Mines. The first commercial scale unit to be built employs the Texaco process which consists of the partial oxidation of coal, and has an output of sufficient synthesis gas to produce 80 tons of ammonia a day or an equivalent quantity of synthetic methanol. At the same time the U.S. Bureau of Mines is working with the U.S. Atomic Energy Commission to investigate the possibility of using a high temperature nuclear reactor at about 1,370°C. to supply the reaction heat. At the moment, since no such reactor is yet available, simulated atomic reactors heated by electricity are being used.

The production of synthesis gas from coal and coke is being regarded with increasing interest, and so far has only been used to any great extent for ammonia and methanol synthesis, but there is always the possibility that the supplies of natural gas may have to be supplemented. This is not due to any shortage since there are ample resources, but the cost appears to be increasing due to the rise in cost of transportation and distribution through local networks.

For a reasonable price to the consumer it is necessary to be quite certain that the pipelines work at the highest possible load factor. Without very considerable storage facilities at the consumers' end of these long, large diameter pipelines there will be very heavy peak load demands to be met. These are being overcome by interruptable contracts to industrial consumers. If, however, cheap peak load gas of high calorific value was available, the present expedients would not be necessary. Attempts are being made to up-grade synthesis gas by raising its calorific value to 900 B.Th.U. per cu.ft., by methanation, and it is estimated that 15,000 cu.ft. of a suitable gas may be produced per ton of coal gasified. Since the consumption of natural gas in 1975 is calculated as being 15 bill. (British reckoning) cu.ft. per year, every 1% of this demand, made from coal by the methanation process, would need 1 mill. tons of coal per year.

The coke oven industry in the United States is responsible for the production of large quantities of gas, though the yield of 10,500 cu.ft. of gas at 567 B.Th.U. per cu.ft. per ton of coal carbonised does not

compare with that of British gas coals. In 1955 1.084 bill. cu.ft. of coke oven gas was produced by the carbonisation of 104.8 mill. tons of coal. Of this 63%, or .689 bill. cu.ft., was surplus after underfiring gas had been accounted for, and of this surplus .473 bill. cu.ft. was used in steel works, .089 bill. cu.ft. was sold for industrial use, .057 bill. cu.ft. was used under boilers, and .07 bill. cu.ft. was distributed as town gas.

Coke oven gas contains as its main constituents 56% of hydrogen and 30% of methane, so that in addition to its use as a fuel gas, it is being processed as a source of hydrogen. Two plants have been built recently in the United States for manufacturing synthetic ammonia, using hydrogen from coke oven gas. With the increased demand for metallurgical coke, the production of coke oven gas is expected to rise over the next 25 years to 2 bill. cu.ft. per annum.

Other processes being developed in the States include low temperature carbonisation by the Disco process with a yield of 3,700 cu.ft. of gas per ton of coal with a calorific value of 413 B.Th.U. per cu.ft. A commercial scale plant using fluidisation techniques is about to be built in the Upper Ohio Valley. The production of motor spirit by the liquid phase hydrogenation of coal is attracting a good deal of attention since it has been found that the yield of motor spirit is several times greater than when coal is being processed for the production of chemicals. The future of synthetic liquid fuels in the United States remains highly speculative and predictions vary widely, but it has been confidently estimated that demand for petroleum in 1975 is 14.6 mill. barrels per day. With a calculated yield of 1.95 barrels of oil per ton of coal gasified, 75,000 tons of coal a day will be needed to synthesise every 1% of this vast quantity of petroleum. In spite of varying opinions, it is generally agreed that a large and very flourishing synthetic liquid fuel industy will be necessary to meet the country's future demand for liquid fuel.

The need for new processes to gasify coal, and indirectly coke, for the production of fuel and synthesis gases appears to be greater than ever in the United States. At first sight perhaps this might seem strange, since the gas industry there has adopted natural gas of high calorific value wherever it is available for use as town gas, especially to the domestic consumer, but it is realised that coal is still the most plentiful fossil fuel. In the not too distant future, therefore, it seems that it will be necessary to return to it, not as a crude solid fuel but as a source of refined, easily handled, gaseous material for the production of heat and a basic material for the synthesis of many commodities for which the demand is constantly increasing.

The B.C.U.R.A. Annual Report

THE Annual Report of the British Coal Utilisation Research Association for the year 1956 contains an account of the research work being carried out at the Association's laboratories at Leatherhead. This work covers a wide range of activities from research on the industrial uses of coal to the design of domestic heating equipment and problems of atmospheric pollution which involve the accurate measurement of the polluting agent.

The report is careful to point out that although atomic energy is undoubtedly with us and is being speedily developed, 218 mill. tons of coal were consumed for all purposes during the year under review. The figure represents 85% of the total energy used in sustaining the industrial life of the country and maintaining the standard of living of the people. The opinion is expressed that more than 20 years will have to elapse before atomic energy will be able to take over any major proportion of the energy requirements in Great Britain, and even then with the expected rate of increase in industrial activity it will do little more than fill the gap between the total energy requirements and that part which can be satisfied by oil and coal.

The importance of the efficient use of coal, therefore, becomes greater and greater, especially since the amount of small coal produced by mechanical mining is constantly increasing with ever higher ash content. Certain types of plant and appliances need large coal for efficient running and because of this the N.C.B. had to import about 3¼ mill. tons of it during 1956, paid for mostly in dollars.

To bridge the gap between energy requirements and the amount of coal available, and at the same time to assist in the implementation of the Clean Air Act, B.C.U.R.A. have carried out a number of researches into the efficient burning of solid fuels in industrial equipment and have started long-term research which later may have a considerable effect on the utilisation of coal other than as a fuel. Such work is the chemical study of the constitution of coal.

The work being carried out on the more practical side of B.C.U.R.A.'s activities include the design of a modified chain grate stoker suitable for boilers of the Lancashire and Economic types. The design has shown that a high percentage of CO_2 can be maintained in the boiler flue gas and has made possible measurements of the effect of a high fines content in the coal, together with the influence of high rank coal with an ash content above 15% on boiler efficiency.

Work has been done on the reduction of deposits in boilers and the corrosion which affects boiler efficiency. It appears that coals with a higher chlorine content form deposits with a greater proportion of sulphate which are much more difficult to remove. A protective coating of ethyl silicate helps the removal of these deposits, but unfortunately at present the coating is removed with the deposit.

Further research has been done with the cyclone combustor, under contract with the D.S.I.R., for burning high ash fine coal, which completes the programme. This is being followed by work on the production of gas by the gasification of coal in a fixed bed slagging producer, which has involved the solving of such problems as the tapping and quenching of the slag, the design of tuyères for introducing coal, steam and oxygen into the reaction zone, and the feeding of coal into a pressurised vessel.

Work continued on the design of gas producers to keep them in line with modern furnace development and further field investigations on clinkering and on tar in producer gas have been made. The B.C.U.R.A. flame evaluator furnace is being developed as a means of assessing the relative merits of flames from producer gas

generated and treated in different ways. This apparatus can be used to measure the effective heating value of flue gases and experiments will continue on producer gas preheated to temperatures up to 1,300°C. Work in progress includes the design of domestic heating appliances and the development of small pipe forced-circulation central heating systems. The chief advantage of the latter appears to be the ease with which it can be installed in existing houses. A member firm is manufacturing under licence a small thermostat which is controlled by the outside temperature.

Among other work carried out during the year is the use of the B.C.U.R.A. sampling probe in the measurement of grit issuing from industrial chimneys. Equipment for measuring the particle size is being developed with the collaboration of a member firm.

CORRESPONDENCE

Railway Electrification—A Problem for Gas

DEAR SIR,

I have read with interest the editorial in your July 31 issue in which the writer reviews some of the difficulties which he feels may arise when the electrification of British Railways commences.

I am writing to you with no more knowledge than can be gleaned from the study of current electrical journals, but unless your writer has evidence to the contrary I cannot for one moment see that railway electrification on the system proposed will present any problems to the gas industry either now or in the future.

Your editorial mentions the possibility of corrosion of steel gas mains caused by straying earth currents. This is an old problem which was far more serious in the past when electric tramway systems were in close proximity to gas mains. All tramways used direct current and, provided 'negative boosters' were installed, earth leakage was kept to a minimum. The railway electrification programme envisages the use of alternating current, and barring the possibility of a slight rectifying action being set up by certain chemical states of the earth peculiar to a few localities, little corrosion is possible.

If there is any authority likely to suffer surely the telephone service would be the first as stray earth currents entering the lead sheathing could cause interference long before they reached a magnitude large enough to damage gas mains? One cannot imagine that the G.P.O.'s requirements would be ignored in this respect by British Railways.

High voltage A.C. railways electrification is by no means unknown in this country. The old L.B. & S.C. Railway had for many years an extensive system in the London area operating at 6.6 kV 25 cycles A.C., and as far as recollection serves no corrosion difficulties in nearby gas mains were reported, although occasionally a fault to earth might cause telephone bells in the locality to ring every time a train passed. Other countries have used A.C. for traction for many years without any serious problems arising.

Your editorial rather suggests that an earth return via the running rails would be the only means of conducting the current back to the sub-stations. If so it would be contrary to the usual practice in electric railways and tramways where a return feeder is invariably run in parallel with the track and bonded to it every quarter of a mile or so.

A return feeder would in fact seem to be an essential feature to ensure continuity otherwise a physical break in the track might produce alarming results.

As regards civil engineering work in tunnels to permit a greater overhead clearance for the high voltage conductor surely the obvious method would be to lower the track rather than to raise the height of the tunnel. It would also be cheaper to lower the track wherever it was crossed by a bridge, rather than to lift a bridge itself.

On the whole I feel that your editorial raises some hares which are not worth chasing, unless any of your readers have any evidence to the contrary. If so the time to air this evidence is now.

It has been said in the past that railway electrification would save some 10 mill. tons of good quality coal per annum at present used by steam locomotives. Is it not possible that some of this coal would be suitable for carbonising? If this is so railway electrification might well help to solve some of the problems of the gas industry rather than present it with new ones.

Yours faithfully,
THERMOPILE.

2, Whitgift Avenue,
South Croydon.

August 12, 1957.

Undoubtedly the track through the great majority of tunnels will be lowered since this is by far the cheapest way of getting the extra head room for the overhead conductors. This was made clear in the editorial. Further in support of our comment is the fact that a tunnel in the North Western Gas Board's area near Stockport is being converted into a cutting. On the other hand, we cannot accept the fact that we have overestimated the dangers of corrosion.—EDITOR.

NEW S.E.G.B. SHIP TO BE LAUNCHED

THE latest addition to the fleet of the South-Eastern Gas Board is due to be launched next month from the Wear Dockyard of Austin & Pickersgill Ltd., the Sunderland shipbuilders.

The vessel, which will have a carrying capacity of 4,600 tons of coal, will be fitted with a British Polar engine by George Clark & North-Eastern Marine Engineering Co. (Sunderland) Ltd.

$170 mill. Pipeline

A $170 mill. natural gas pipeline built by the Westcoast Transmission Corporation from Peace River through British Columbia has just been completed. About half the 662 miles of pipes used in the project were supplied by the South Durham Steel & Iron Co., Ltd., of Stockton-on-Tees. The same firm will be busy until July, 1959, on the supply of pipes for the Trans-Canada (west to east) natural gas pipeline.

Diary

September 3.—SOUTH EASTERN G.C.C.: Caxton Hall, Westminster, London, S.W.1. 11 a.m.

September 3.—EAST MIDLANDS G.C.C.: Victoria Station Hotel, Nottingham. 11.30 a.m.

Dividend Passed

No Ordinary dividend is recommended by George Wilson Gas Meters Ltd. for the year ended March 31 against 15% for the previous ten years. A group loss of £2,445 was incurred against a profit of £44,299 for 1955-56, before charging tax of £640 (£21,880).

WORKMAN'S PICK CUTS SERVICES

A SPARK from a workman's pick which set fire to a gas main at Melton Mowbray (Leicestershire) recently, cut part of the town's domestic gas supply, affected electricity supplies and some telephones.

A wall of flame about 6 ft. long and 20 to 25 ft. high burst from the pipe. Firemen smothered the flames while Gas Board men worked to cut off the supply.

W.M.G.B. REVISES GAS TARIFFS

More than £2 mill. to be Recovered through New Scale of Prices

BECAUSE of the heavy increase in the cost of coal and other factors new scales of charges for gas will come into force in the West Midlands area after September. In consequence most consumers will pay higher prices.

This announcement was made by the Chairman of the West Midlands Gas Board, Mr. G. le B. Diamond, following a meeting last week at which the Consumers' Consultative Council approved the Board's proposals.

Mr. Diamond pointed out that over the last 12 months additional costs amounting to £2,868,000 had been imposed on the Board, mainly as a result of increased coal and freight charges and wages and salary awards. Over one quarter of these extra costs will be absorbed by way of internal economies and the balance of £2,100,000 will be recovered through the new scale of prices.

Apart from varying prices to cover the additional revenue required, the tariffs have been altered in two important respects. A relatively high price will be charged for the first 'block' of 12 therms used each quarter to allow for the recovery of standing charges, but a much lower price will apply to consumption in excess of 12 therms. As the average rate of domestic consumption is 30 therms each quarter, most consumers will pay for a large part of the gas they use at this lower price.

The other change relates to the number of district price differentials. Prior to 1952 there were 200 different methods and rates of charge, but up to the present these have been reduced to seven and are to be further reduced to four under the new tariffs.

The four group prices are as follows:

Domestic consumers will on average pay 5¾d. per week more under the new tariffs in Coventry, Hinckley, Kidderminster, Oswestry, Redditch, Shrewsbury and Wellington, and 5d. a week more in Birmingham, Bilston, Kidsgrove, Newcastle, Smethwick, Stafford, Stoke, Stone, Walsall and Wolverhampton. Smaller increases will apply elsewhere and in a number of country towns and villages domestic consumers will on average pay no more than at present.

Adjustments have also been made in the prices charged to industrial and commercial users of gas, who will pay for the first 500 therms at the second price shown in the general tariffs, plus a meter rent or standing charge, with reduced prices for successive blocks of consumption.

Details of the group tariffs are shown in the table below. Left hand column refers to first 12 therms; right hand column, all over 12 therms.

	per therm s. d.	per therm s. d.
Group 1 (Stoke, Newcastle, Congleton, Leeds and Kidsgrove)	2 1	1 5
Group 2 (Birmingham and Smethwick)	2 6	1 7½
Group 3 (Wolverhampton, Walsall and other Black Country towns; Stafford and Stone)	2 8	1 8½
Group 4 (All other districts)	2 10	1 9½

N.E.G.B. Gives Details of Increases

AS forecast in our August 7 issue, the North Eastern Gas Board has now announced increased gas prices to help offset costs which have risen during the past year by £1,285,000.

Details of the new tariff are:—

An increase in the district flat rate prices of gas by amounts varying from 1d. to 3d. a therm, the average increase throughout the area being 1.8d. a therm. At the same time, the structure of the domestic two-part tariff and the discounts thereunder will remain unchanged so that consumers on this tariff will not bear the full flat rate increases.

On the other hand, discounts on the all purposes non-domestic block rate are to be increased by an additional ½d. a therm for quarterly consumptions between 5,000 and 25,000 therms and by an additional 1d. on consumptions over 25,000 therms a quarter

The bread baking rate for consumptions of gas over 100 therms a quarter is to be increased by 1½d. a therm.

The increases take effect from the middle of this month.

Announcing the tariff changes, Sir John Stephenson, C.B.E., Chairman of the Board, said he found it difficult to forecast the future for so many facets of the Board's price build-up were affected by decisions and circumstances outside its control. The Board would have to curtail its capital development programme, and finance more of its capital needs from revenue.

Given an end to present upward trend of costs the Board would be able to demonstrate more clearly in the price of gas its achievements since vesting date.

GUERNSEY ADOPTS GAS UNIT CHARGE

THE Guernsey Gas Light Company is to introduce the gas unit method of charge in September. Gas is supplied at 450 B.Th.U. per cu. ft., and the gas unit will be equivalent to 3,414 B.Th.U. (i.e., 132 units per 1,000 cu.ft.).

Pictured above is the stand erected by the West Midlands Gas Board at the recent boy scouts' jubilee jamboree at Sutton Coldfield. The exhibit, which had to be generally instructive, was designed in the Board's publicity office.

Belfast Has Record Number of Consumers

BUT THE UNDERTAKING SHOWS £7,000 DEFICIT FOR YEAR

MORE people than ever before are using gas in Belfast, Mr. J. L. Hyslop, Engineer and Manager, told the Corporation Gas Committee recently when presenting the annual report. The figure had risen by 891 to 140,635, he said.

Earlier, Mr. Hyslop had expressed disquiet at rising costs which showed no sign of levelling off. The undertaking had to pay 16s. more per ton of coal than in April, 1956, and the average cost of coal at Belfast quay was more than 5½ times the pre-war price. The delivered cost of coal was their greatest handicap, coal representing 70% of their total gas production costs.

A working profit was reported for the year of £236,545—£56,688 more than for the previous year. But capital charges for interest on and repayment of loans rose by £39,963 to give a deficit of £7,203 on the total revenue of £2,886,244.

The deficit, said Mr. Hyslop, was the result of the heavy increases in coal and wages. Revenue from gas totalled £2,128,662, but the mild winter had had a pronounced effect. Output for the year, at 5,427 mill. cu.ft., showed a reduction of 177.9 mill. cu.ft., or 3.18%.

Coke sales were satisfactory and amounted to 74,037 tons, with a revenue yield of £407,243, an increase of £15,018 compared with the previous year; while a deficit of £3,275 in 1955-56 on the working of ammonia products had been turned into a credit of £5,945 for the year under review. This followed the installation of a completely modern plant at a cost of £37,000.

There had been no easing in the work of distribution during the year, and miles of mains had been laid in connection with new developments, bringing the total length of gas mains now in service up to 971 miles.

Two Bouquets

The seventh annual sports meeting of the Tees-Side Division of the Northern Gas Board was held recently on the Redcar race course. Mr. J. E. White, Deputy Chairman of the Board, and Mrs. White were present, as well as Mr. L. A. Garratt, Industrial Relations Officer of the Board, and Mrs. Garratt; Mr. M. Allon, Member of the Board, and Mrs. Allon; Miss Winter, Secretary of the Northern Gas Consultative Council; Mr. W. R. Garrett, Constructional and Consultant Engineer, and Mrs. Garrett; Mr. John W. Pallister, Divisional General Manager of the Tees-Side Division, and Mrs. Pallister; and Mr. and Mrs. A. Cunningham. Our picture shows presentation of bouquets to Mrs. White and Mrs. Pallister.

I.R.A. BOMB PUSHES UP GAS COSTS

I.R.A. bomb damage to the port of Newry (County Down) has pushed up the costs of the gas undertaking. They are now compelled to obtain their coal by road from seven-miles-distant Warrenpoint on Carlingford Lough.

The suppliers, however, have promised to try to offset the difference by shipping the coal in larger vessels at lower freight rates. In view of this Newry Urban Council Gas Committee has dropped plans being made to lodge a complaint.

Meanwhile Mr. J. Collins, Gas Manager, reports good progress in plans to form a gas association for small undertakings in Northern Ireland. Six undertakings have already agreed, and a decision is awaited from two others.

It was hoped to complete early next year the reconstruction of the 'C' bench vertical retort installation. The cost would be £400,000. When this had been done major work of reconstruction of carbonising plant, deferred as a result of the war, would have been completed. Expenditure on the work, which had been going on continuously since 1948, had amounted to £1,026,000.

Other Ulster news comes from Coleraine (Co. Londonderry), where the Borough Council has approved an increase in the price of gas of 10d. per 1,000 cu.ft., though consumers will not be affected until October after the next ordinary meter reading.

The new charges will be—Coleraine: Ordinary meter, 11s. 8d. per 1,000 cu.ft.; slot meters, 12s. 1d.; Portstewart, ordinary meters, 12s. 6d.; slot meters, 12s. 11d. There will also be an increase of 10s. per ton in the price of coke and breeze delivered after September 1.

The Gas Committee reported that from June 21 till July 26 the amount of gas manufactured was 14,403,000 cu.ft., a decrease of 1,705,000 cu.ft. compared with the corresponding period last year.

Meanwhile in Bangor (Co. Down), the Borough Council has decided that gas consumers whose quarterly meters were read during the first fortnight of August and who have paid their accounts based on the increased price of gas will receive a refund of the difference between the old and the new rate. Some 200 consumers are affected.

Strabane (Co. Tyrone) gas undertaking made a net profit of £371 during the year ended March, 1957, compared with £43 the previous year.

SECRET INSTRUMENTS WILL AID WAR AGAINST SMOG

INSTRUMENTS installed in secret places known only to the Sanitary Inspector's Department will measure soot, smoke, and grit in a bid to beat smog in the Kirkcaldy area. 'The instruments are delicate,' explained Mr. John Page, Chief Sanitary Inspector, 'and we are keeping their location secret as a precaution against vandalism. A couple of minutes would be sufficient for some hooligan to wreck weeks of work and destroy valuable information.'

These strategically placed instruments will help to assess the effect on health and amenity of smoke from linoleum works and other factories in the neighbourhood. They comprise an 'impurity-deposit,' gauge which analyses rainfall, and two lead peroxide candles that measure sulphur corrosion on stone and metal work. There will be indications also of tarry deposits from chimney smoke, unburnt fuel, grit, and ash from industrial plants.

Nothing will be hidden from the Sanitary Department men on their monthly check-up. The information will go to the Department of Scientific and Industrial Research who will collect the data on a national scale.

'Our information should provide, in particular, an indictment against factory chimneys pouring out grit and ash,' said Mr. Page.

Electronic 'Brain' Makes Out Gas Bills

N.E. BOARD REORGANISES ACCOUNTS DEPARTMENT

Computer and Ancillary Equipment Produce 'Revolutionary' Results

Staff at work in the new central accounts offices.

THE new central accounts offices of the North Eastern Gas Board were completed by December 1, 1956, and thus began the unfolding of the Board's plans for the eventual centralisation of a considerable part of its accounting functions.

The new offices consist of two large open rooms—one to house the accounting and clerical staff and the other for the mechanised accounting equipment with its attendant operators. With windows completely covering both sides, the natural lighting on the contemporary decorations gives a most pleasing effect to the whole atmosphere. The machine room is specially sound insulated and it is possible to converse in a normal manner even when all the machines are in use.

The story behind this new venture really started some three years ago when the further use of mechanical accountancy equipment was being considered. At that time the idea of separate installations of punched card equipment to deal with expenditure records was envisaged for each group and, in point of fact, the first installation was ordered and installed at Bradford. Consumer accounts are dealt with on the normal book-keeping type of machines.

In 1955 it became obvious that the introduction of electronic digital computers for dealing with many accounting and clerical operations must be seriously considered. The experience of public utility undertakings, both in the United States and on the Continent, had shown their practical value. The day of experiment had long passed and, in fact, in the United States the preparation of gas accounts, payrolls, and other similar repetitive work was now subsidiary to the more important information which could be produced simultaneously by such computers for management purposes.

The computers now being marketed primarily for commercial purposes must not be confused with those in use in certain Government departments and universities as these are specially designed for the work to be undertaken. To the large organisation there are now available a number of computers from which to choose, any of which may be suitable for the gas industry. These computers use as a medium for transferring information, punched cards, magnetic tape, wire, or film.

Above, the roof before the new central accounts offices were built. Below, part of the interior.

As a result of its investigations the Board decided that there was a field for the use of computers in its organisation, firstly to deal with the gas account preparation and secondly for payrolls. The Board thereon ordered two Powers programme controlled computers and the necessary ancillary equipment, using 80 column punched cards as its medium of transferring information. The capacity of one of these computers would be sufficient to deal with the work mentioned, but as there are many other accounting operations of a repetitive nature, the potential work to be undertaken is considerable.

'Stored' Information

This computer works in accordance with pre-determined programmes and carries out a sequence of arithmetical calculations calling on 'stored' information for use, if needed. The programmes are set up in the computer by means of four cards, in each of which 40 instructions can be contained making 160 instructions available for each complete accounting procedure.

The Powers P.C.C. is a standard model so that provided the programme cards are available any such computer could carry out the work. Thus reciprocal arrangements could be made between two users in emergencies. Further, it allows work to be carried out on a service basis if the need arises.

By itself, the computer is a wonderful advance on any other type of calculating machine, but the results become revolutionary when it is used in connection with the new Samastronic tabulator and printer now being produced by the same manufacturer.

Up to the present time the production of the gas account, payroll and pay ticket, and similar documents has been restricted to the limit of mechanical equipment. This new printer is at least three times faster than any known mechanical counterpart. The printer works on a minimum of 300 cycles per

minute and the normal gas account will require 8 or 9 cycles. Thus between 30 and 40 accounts can be run off per minute or, say, a minimum of 2,000 per hour. So far as is known even in the United States there is not available a printer of this type although there must be a potential field for exploration by other manufacturers.

In order that computers can be used economically it is necessary for this Board to deal with all its gas accounts, the preparation of payrolls, and any other similar work at a central point. The eventual centralisation of such operations gave rise to a reconsideration of the policy in connection with expenditure records.

It was decided that by concentrating the equipment in one place further savings could be obtained. It was therefore decided that the machines for dealing with expenditure records, etc., would also be housed alongside the computer and its allied machines.

The required accommodation, about 9,000 sq. ft., was not available at any point in the Board's area and it was decided to build a further storey on part of the premises belonging to the Board adjacent to its existing Head Office in Leeds. This accommodation, now complete, will be sufficient to house the whole of the centralised accounting operations as envisaged.

The reorganisation of the accountancy department falls into two broad categories. The first consisting of expenditure and statistical control is being dealt with on the Powers 40 equipment already installed. The equipment installed consists of eight automatic key punches, one automatic verifier, two sorters, one interpolator and three tabulators with summary card punches. One of the tabulators is designed to print letters as well as figures and is used for such work as payment of suppliers by preparing both the remittance advice and the actual cheque. The second category will cover the work for the computers which will not be undertaken until the second half of 1958, during which delivery of the equipment is scheduled.

In all commercial organisations the introduction of machine accounting methods has emphasised the need for accurate basic records. The machines can only deal with the information which is fed into them, and even the age of computers will not change this fundamental principle. With the higher speeds of output the accuracy of the basic information is even more important than before if the sequence of operations is not to be held up or slowed down. In this Board, through its district or group offices, must continue to rest the responsibility for this accuracy.

The reorganisation has been planned well in advance and the opportunity was taken in the initial stages to advise the staff associations of the broad plans and, as they have developed, to consult with them. All new positions are openly advertised throughout the Board, and it is expected that they can all be filled by existing personnel. Where necessary training is arranged for those who are appointed to positions requiring specialised knowledge.

New Coke Oven Plant for Sheepbridge

CHESTERFIELD Town Council has approved in principle the erection at Sheepbridge of a coke oven plant which will produce 18 mill. cu.ft. of gas a day.

The plant is to be erected by the Staveley Iron and Chemical Co., Ltd., of which the Sheepbridge Co., Ltd., is a subsidiary, on the site of the existing tip at the junction of Sheffield Road, and Dunston Lane.

The main purpose of the new plant will be to feed the two Sheepbridge blast furnaces with 'tailor made' coke. The gas will probably be offered to the East Midlands Gas Board.

Best Modern Practice

The plant will consist of a coal discharge, handling, and storage plant; two batteries of coke ovens; coke screening and loading plant; a by-product plant; a gas purification plant; gas boosting equipment; a gasholder and various administrative and maintenance buildings.

The company has promised that the plant will be based on the best modern practice, including total sulphur removal from all coke oven gas. As a result of the scheme the emission of dusty blast furnace gas into the atmosphere will be substantially lessened they claim.

There will be no tar distillation and no acid plant, and spent oxides will be conveyed to existing works at Staveley for processing.

The plant is expected to employ about 200 men. The Avenue Plant at Wingerworth by contrast employs 475 men and each of the two batteries of ovens can produce 27 mill. cu.ft. of gas a day.

BENDING HIS FIRST PIPE

John Longhorn, of Finchley, N.3, tries his hand at pipe bending under the watchful eye of apprentice gas fitter Peter Love on the Gas Council stand at the Boys' and Girls' Exhibition at Olympia. Seen, right, is William Woboys, of Barnet.

Lower Profits Ahead

The interim report of Yorkshire Copper Works, Ltd., which announces the interim dividend as 6% less tax (same), states that while the works have been and are being fully employed the profits for the current year owing to the reduction in profit margins are likely to be appreciably less than for the previous year. This is not expected to jeopardise the final dividend.

The Coppee Company

The Coppee Company (Great Britain) Ltd., have obtained a contract for approximately £1¼ mill. for coke oven, chemical by-product, and coal preparation plant for the Rhodesian Iron & Steel Co. Ltd.'s steel works extensions at Que Que, Southern Rhodesia. This contract has been obtained through the operation of the associated company, Powell Duffryn-Coppee Ltd.

Three Companies to Amalgamate

Dean Sales Promotion Ltd.

THREE companies will amalgamate on October 1 when W. H. Dean & Son Ltd., G. L. Howarth & Co. Ltd., and Henry Slack & Sons Ltd., combine to become Dean Sales Promotion Ltd.

The present three sales forces will be unified to form a single team of Dean representatives. The new company will sell under the name Dean all models now sold by the three Companies.

The creation of this Company will make it possible to advertise on a large scale and a national Press and T.V. advertising programme will be launched early next year. A new research, design and development department has been created, and it is the aim of the Company to introduce further new and improved washing appliances.

The Directorate of the Company will be: MR. D. K. WARD, Chairman; E. FIELDEN, Administrative Director (late Director of W. H. Dean & Son Ltd.); MR. M. A. GRIFFITH-JONES, O.B.E., Sales Director (late Sales Director of W. H. Dean & Son Ltd.); MR. R. W. THOMPSON, Publicity Director (late Sales Manager of Henry Slack & Sons Ltd.); and MR. A. THORNTON, J.P., Financial Director.

The new Company's representatives will be:—MR. H. GREENWOOD, North Western Gas Board—Northern Group, West Lancs. Group, East Lancs. Group, and Central Lancs. Group.

MR. A. GRAHAM, East Midlands Gas Board—Leics./Northants. Division and Notts./Derby Division.

MR. M. PARKINSON, South Western Gas Board.

MR. E. R. C. GILROY, Eastern Gas Board—Watford Division and Tottenham Division; North Thames Gas Board—South West Division.

South Eastern

MR. B. B. MARSHALL, South Eastern Gas Board—East Surrey Division, Sussex Division, and Kent County Division.

MR. E. K. GAINES, North Eastern Gas Board—Bradford Group, Leeds Group, Wakefield Group, and Halifax/Huddersfield Group.

MR. J. A. STONES, East Midlands Gas Board—Sheffield/Rotherham Division and Lincolnshire Division.

MR. L. C. D. DOIDGE, Eastern Gas Board—Norwich Division, Cambridge Division, and Ipswich Division; North Thames Gas Board—Mid-Essex Division and East-Essex Division.

MR. F. BACKHOUSE, North Western Gas Board—Liverpool Group, Manchester Group, and North Cheshire Group.

MR. W. S. JOWETT, Northern Gas Board—Blyth Division, Tyneside Division, Sunderland Division, and Cumberland Division.

MR. C. H. SMITH, Northern Gas Board—Darlington Division and Tees-side Division; North Eastern Gas Board—York/Harrogate Group and Hull Group.

MR. J. C. HAWKSFORD, West Midlands Gas Board—Shropshire Division, Wolverhampton Division, Worcs./Hereford Division, and Warwickshire Division.

MR. S. E. KEDGLEY, North Thames Gas Board—Western Division, Central Division, Northern Division, North Western Division, and Eastern Division.

MR. A. F. A. GILROY, Southern Gas Board and Channel Isles.

MR. J. T. ROBERTS, North Western Gas Board—Wirral Group, Mid-Cheshire Group, and South Lancs. Group; Wales Gas Board—Wrexham Group, Anglesey Group, Clwyd/Deeside Group, Eryri Group, and Montgomery Group.

Wales

MR. J. ADCROFT, Wales Gas Board—Cardigan Group, Brecon Group, Pembroke Group, Carmarthen Group, Swansea Group, Mid-Glamorgan Group, East-Glam. Group, Pontypool Group, Newport Group, and Cardiff Group.

MR. C. MACE, West Midlands Gas Board—Birmingham Division, Walsall Division, and North Staffs. Division.

MR. H. LISTER NUTTER, South Eastern Gas Board—Metropolitan Division, West Surrey Division, and Kent Suburban Division.

Representatives for Scotland, Northern Ireland, and Eire will be announced later.

The first new model which the Company will introduce is the 5-gal. Dinkie Dean boiler to retail at £5 19s. 6d. with 4-ft. length of Compoflex, an attractive boiler designed to reach and provide a new market for gas appliances. To launch this new model a large Press and T.V. advertising campaign is being conducted in the Midlands I.T.V. area, covering the West Midlands Gas Board and the Leicester and Nottingham Divisions of the East Midlands Gas Board; at a later stage the advertising will be extended throughout the country.

Change of Address

Spencer-Bonecourt-Clarkson Ltd., have moved to 28, Easton Street, London, W.C.1. Telephone: Terminus 7466.

ENQUIRY INTO £4.5 MILL. PLANT CONTINUES

BOTH sides may be represented by Q.C.s at the second public enquiry concerning the proposal to build a £4.5 mill. gasification plant at Coleshill, Birmingham.

The enquiry will be into the appeal by the West Midlands Gas Board against the refusal of planning permission by the Warwickshire County Council and Meriden Rural District Council, largely because of the effect on the green belt and amenities.

Arranged for October 9, the enquiry will be held by inspectors of the Ministries of Housing and Power in the Water Orton parish church hall, as it is expected that the Meriden Council chamber at Coleshill will be inadequate for the numbers likely to attend.

The first enquiry was held last October, and the then Minister of Fuel and Power decided that half of the site, at the lower end of Coleshill, was 'operational' land. The Queen's Bench Divisional Court recently dismissed with costs an application by the County Council for an order quashing the Minister's decision.

80-year-old Gas Holder to Go

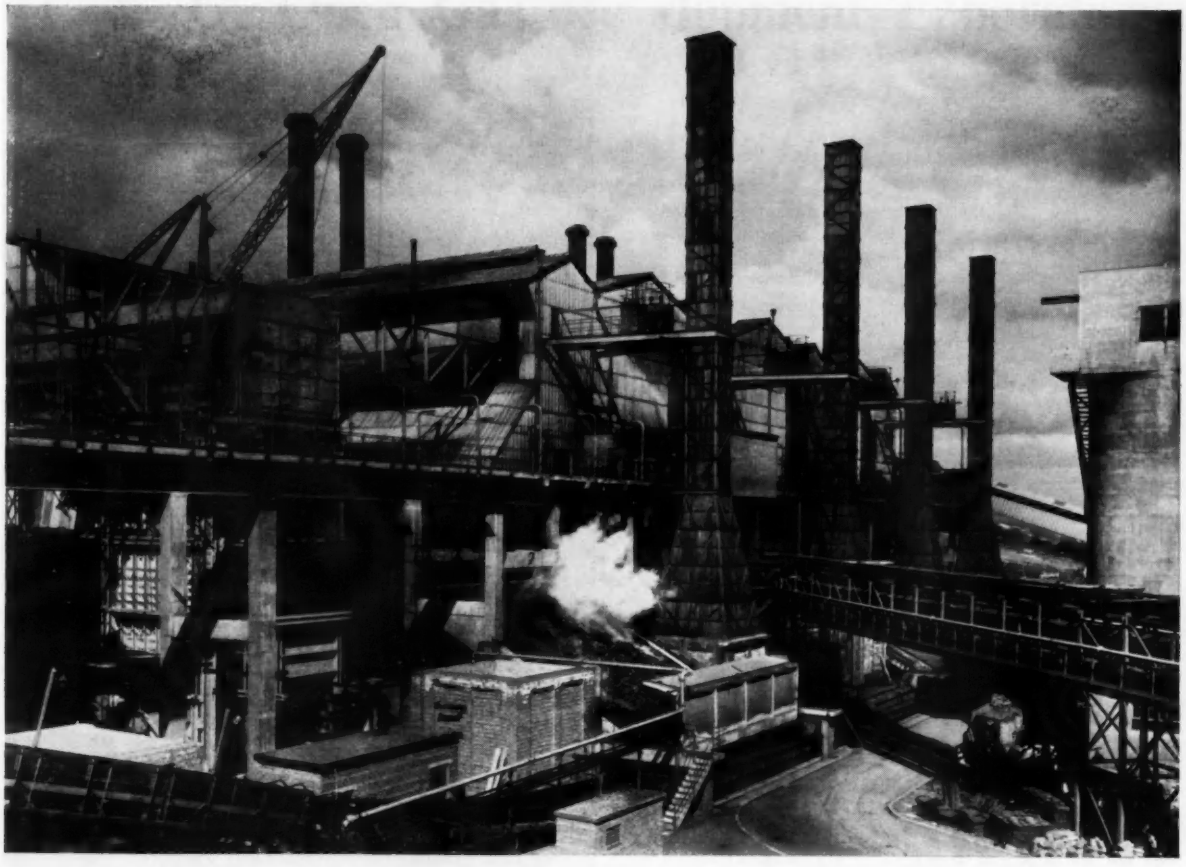
COMPLETION of a West Midlands Gas Board project at Hednesford will mean the disappearance of a gasholder which has been in use for over 80 years.

For some years the holder has been operated under difficult conditions, because mining subsidence had upset the level of the tank to the extent of about 1 ft. and made the upward and downward motion on the guide rails increasingly difficult to control.

Nevertheless, the general condition of the holder after so many years speaks volumes for the remarkable durability of the Lowmoor wrought iron, which was in common use before the introduction of mild steel about the beginning of the century.

CHAIRMAN AT WELSH SHOW

Mr. T. Mervyn Jones, right, Chairman, Wales Gas Board, inspects appliances on the Gas Council stand at the Royal Welsh Show, Aberystwyth.



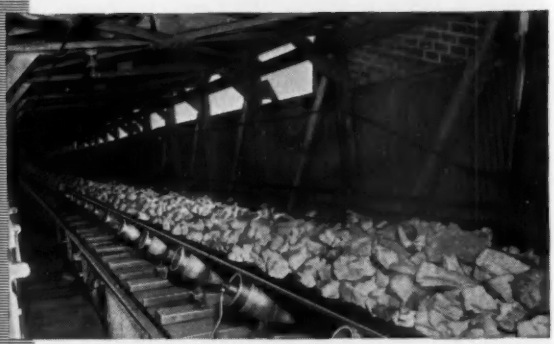
The second installation of W-D Intermittent Vertical Chambers at the Rotherham Works of the East Midlands Gas Board — two further benches of 21 chambers. When all six benches are in operation 15 million cubic feet of 500 B.Th.U. gas will be produced daily.

WOODALL-DUCKHAM CONSTRUCTION COMPANY LTD

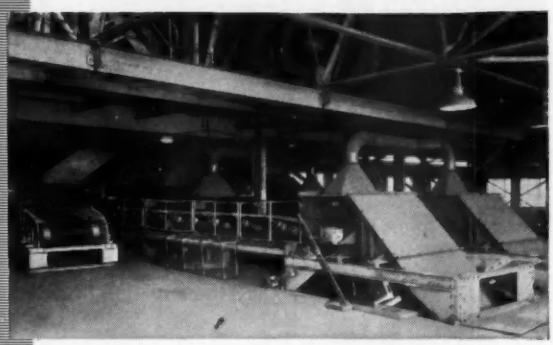
Woodall-Duckham House, 63-77, Brompton Road, London, S.W 3 'Phone: KENsington 6355 (14 lines) 'Grams: Retortical (Southkens) London

GOODYEAR

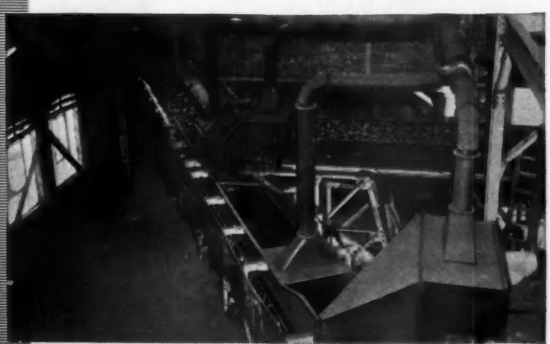
CONVEYOR BELTING FITTED WHERE ABRASION IS MOST SEVERE



At the new South Bank Coke Ovens of Dorman Long (Steel) Ltd., the output of hot, unscreened coke from 150 ovens which carbonise 25,000 tons of coal per week is carried on this 48 in. Goodyear "Stacker" belt. It is 1,700 ft. long and is probably the longest coke wharf belt in the country.



Blast furnace coke passes over the screens and on to the duplicate conveyors on the right. Undersize coke is diverted to the conveyor on the left, the first of a series handling domestic coke—all fitted with Goodyear "Stacker" belting.

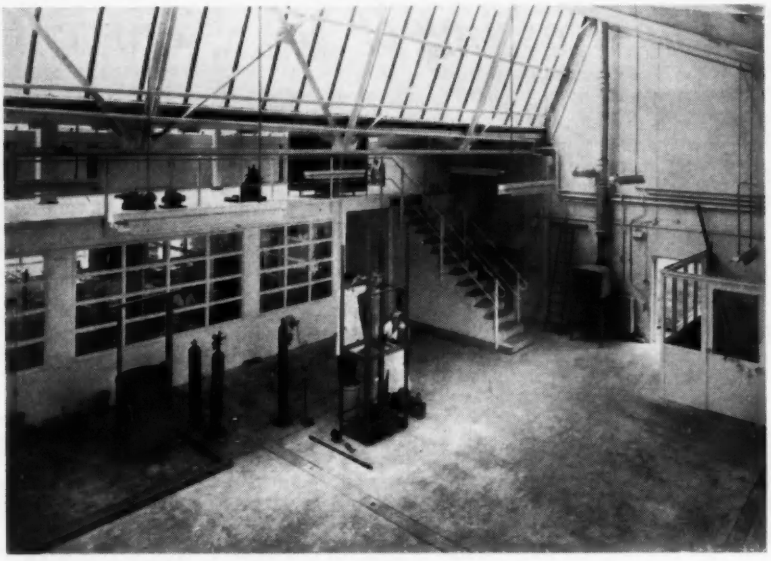


The conveyor on the left is the first of a series leading to the blast furnace stockpile. All belts, including those handling incoming "foreign" coke, are Goodyear "Stacker". Throughout the plant, the largest single unit in Britain, Goodyear belting has been fitted wherever abrasion is most severe.

THE GOODYEAR TYRE & RUBBER COMPANY (G.B.) LIMITED, INDUSTRIAL RUBBER DEPT., WOLVERHAMPTON

H. &. G. Open Gas Development Laboratory

LARGE APPARATUS CAN BE ACCOMMODATED



GAS purification and developments in catalytic oil gas making are important items in the programme to be followed in a new laboratory opened by Humphreys & Glasgow Ltd., at Billericay, Essex.

Work on other new methods of gas-making will also be carried out, together with short-term investigations arising from the company's entry into the chemical process field.

The building (pictured here) is designed to provide the necessary space, height, and services for tests not only on the laboratory scale, but also with larger apparatus which could, if required, be transported complete to a works for further tests.

Modern laboratory equipment is provided for all aspect of this work. The laboratory adjoins the main building on the site, which houses a large store for engineering equipment used by the company's construction teams in the field. A private siding serves the store. The main building also houses a plant for processing and treatment of catalyst for the company's Onia-Gegi oil gas process.

The Billericay developments are part of the expansion of Humphreys and Glasgow, founded 65 years ago to bring the carburetted water gas process to Europe from America. To the design and installation of C.W.G. and oil gas plant in many parts of the world, the company has now added underground gasification of coal (for the National Coal Board); mechanical handling; chemical engineering; and the marketing of small nuclear power plants.

Architect of the buildings was Mr. Hubert Evans. The laboratory was planned according to the requirements of Humphreys and Glasgow's chief chemist, Dr. R. H. Sapiro, and the furnishings and much of the equipment was provided by Griffin and George Ltd. It is in charge of Mr. R. C. Craig under Dr. Sapiro.

Powell Duffryn Profits Rise

CONSOLIDATED trading profits of Powell Duffryn Ltd., including income from investments and interest receivable for the year ended March 31, 1957, after deducting interest on debenture stock, directors' remuneration, and profits attributable to outside shareholders, amount to £2,199,237 (previous year £1,978,196).

To this has been added £15,594, being the final amount accrued in respect of interim income under the Coal Industry Nationalisation Act (last year £337,922, mainly for previous years). Depreciation charged before arriving at the above figures was £753,672 (£605,814).

Taxation requires £1,176,398 (£1,245,886), leaving consolidated net profit for the year at £1,038,433 (£1,070,232), to which has been added a transfer from taxation reserve of £178,000 (nil), bringing the total consolidated net profit up to £1,216,433 (£1,070,232).

Final dividend of 10% actual, less income tax at 8s. 6d. in the £, is recommended on the 9,660,471 ordinary shares of 10s. each in respect of the year ended March 31, 1957 (making with the interim dividend of 6% actual paid on February 26, 1957, 16% for the year).

The amount at the credit of the consolidated profit and loss appropriation account to be carried forward to 1957-58 is £2,522,959 (£2,193,320).

Change of Name

Subject to confirmation by stockholders, the British Tyre & Rubber Co. Ltd. will change its name to BTR Industries Ltd. as from September 16—a titled designed to emphasise its relationship to industry in general as British Thermoplastic and Rubber manufacturers. The 'BTR' trademark will continue to identify the Company's products.

New Office

Fielden Electronics Ltd. are to open their new north eastern sales and service office at Stockton-on-Tees on September 5, MR. VICTOR THOMAS, General Sales Manager, announces. The branch is under the management of MR. KEN HYMER, the Company's Representative in the North East, who is now supported by experienced service engineers in this area.

Cork Dividend

Interim dividend of 3½% for the year ending December 31, 1957, has been declared by the Cork Gas Consumers Company.

Newton Chambers to Erect Hot Blast Cupola

AN important order has been received by the Engineering Division of Newton Chambers and Co., Ltd., of Thorncliffe, near Sheffield, from the British Cast Iron Research Association for an experimental hot blast cupola installation at Alvechurch, near Birmingham.

The Association require this installation for research into more efficient methods of melting, and the conclusions reached will be of benefit to the iron foundry industry in general.

Meanwhile, Newton Chambers and Co., Ltd., have been placed on the Lloyds Register of Shipping Approved List of makers of Class I fusion welded pressure vessels.

Class I welding is required for equipment such as heat exchangers, pressure vessels for the atomic power industry, and the needs of petroleum, chemical, and oil industries.

Before Lloyds approval was granted the Company's equipment methods, the ability of their workmen, and the thoroughness of the systems of inspection and testing, etc., were thoroughly examined.

ASSOCIATION TECHNIQUE DE L'INDUSTRIE DU GAZ EN FRANCE

The Passing of the 'Three Gas Industries'

ADDRESSING the 74th Congress of the Association Technique de l'Industrie du Gaz en France, M. Georges Nérot, who was concluding the second year of his Presidency, said he thought that until recent years there had been 'three gas industries' having each its own sphere of action: One within industrial combinations, treating only large quantities of gas; a second serving domestic and commercial consumers in large or small urban concentrations; and a third serving rural consumers. But in the last 20 years, in a period which but for the war and the occupation must have been shorter, some facts of considerable importance have appeared. There has been the necessity for the mining and steel industries to reduce their costs of production by enhancing the value of their by-product, gas; and there has been the Government's desire to disperse the great industrial centres, increasing the distance of works from their sources of energy. Then the discovery of deposits of natural gas and the modification of petroleum techniques liberating in the refineries growing quantities of incondensible gases, and the coming transport of methane in liquid form have completely changed the structure of the gas industry in France.

After surveying the situation of the industry in other countries, M. Nérot discussed future developments: As soon as, within a given country, large quantities of gas are liberated, such as products derived from other manufacturing processes or natural gas, manufacture proper by the gas industry tends to disappear, he said. There will arise an organisation between producers and distributors. This organisation will purchase gas from the producer who will have no direct relations with the consumer. It will resell the gas either to its own industrial clientèle or to the distributors. It will be formed, either by the producers whose interests it will serve, or it will be a legal creation in which producers will be represented. These intermediate organisations may deal solely with transport, as in the case of natural gas in the U.S.A. If there should arise several independent organisations it will be necessary to have a plan of national co-ordination. If the gases are of different kinds, as in Belgium and Holland, the unity of the transport organisations is still more necessary since it must act as collector and it must condition the gases to render them interchangeable. If the gas is transported in the crude state, as in the U.S.A., it is converted by the distributors to render it interchangeable with gas from other sources. Transport, to be economic, must operate with a high load factor of some 75 or 80%. Sale is, on the contrary, essentially seasonal. The adjustment of these two contradictory factors is at the charge of the distributor who must equip himself with auxiliary means of production to cover peak loads or alternatively to safeguard supply. 'But the most elegant solution is to be provided with a large underground storage or, when the technique is available, with a storage of liquid methane.'

M. Nérot proceeded to examine the position of the gas industry in France after ten years of nationalisation. The structure he would like to see in France would comprise producers, co-ordinating organisations possessing means for the manufacture and storage of gases and of conditioning and delivering them in the qualities and quantities required by the users and distributors in immediate contact with consumers. There were many difficulties in the realisation of such a structure. For instance, the Government had withdrawn from Gaz de France the monopoly in the transport of natural gas without confiding it to anyone. But he had faith in the future.

Evolution of the Demand for Energy

IN his address to the Congress, M. le Guellec, Chairman of the Administrative Council of Gaz de France, spoke on the evolution of the demand for energy and the part to be played by gas in the satisfaction of this demand. He stressed the importance of energy in every branch of economic life, though the production and distribution of energy, viewed as a section of industry, might appear to be a relatively small fraction of industry as a whole.

For the 17 countries grouped under O.E.E.C. it employs less than 2% of the total active population. Its contribution to the cost of gross production in these countries is of the order of 6%—expenditure for energy, for example, represents between only 4.3% and 4.5% of household expenses in France. The purchase of energy in one form or another forms a notable fraction of the costs of production in some industries—in the steel industry, more than 25%; in the structural industries, ceramics, glass, paper, of the order of 12% to 16%; in chemicals and certain metallurgical processes, about 10%. But for most of the other industries, the incidence of energy cost is less than 5%.

The importance of energy is, however, out of proportion to what these considerations would lead one to suppose. It stems from the fact that it is a basic need, necessary to all industrial activity, whether for the specific use of energy in production, such as the use of coke in the blast furnace, as mechanical power, or for heating purposes in industry and in the home.

Annual investments in the energy industries are very high; in France, they amounted to more than 350 milliards of francs in 1956, while 450 milliards are expected in 1957. These investments represent about 15% of total investment. In 1954, 18% of the investments of the countries of O.E.E.C. were devoted to energy and this proportion is expected to increase in the years to come.

The energy industries are also characterised by a relative rigidity of production. This is particularly so in the coal industry, since a total of ten years is required to sink a pit and to complete the workings and equipment to the point of production. If not so long, the time which separates the time of a decision to proceed with a scheme and the effective supply of energy in other forms is measured in years, whether it is a question of boring for petrol or natural gas, constructing a dam, a coking plant, a refinery, or an electricity generating station—during which time the capital involved lies idle.

It is therefore necessary to forecast a long time in advance the possible consumption of the form of energy in question. An error in judgment may have serious consequences. Particularly important are the effects of periodical variations in demand, which accentuate in certain cases the difficulties or impossibility of constituting adequate stocks, so that capacity must more or less cover the peak load.

Finally, there is the dependence on imports for a large part of the demand to be satisfied. The total energy deficit for France rose to more than 40% of her needs in 1956; more than the deficit observed in the other countries of O.E.E.C. which was about 20% in 1955. 'Recent events have shown the risk inherent in too great a dependence on particular sources of supply, for example, petrol from the Middle East and American coal. In the next 20 years the position is expected to deteriorate. The deficit for O.E.E.C. will pass to 30% in 1975. And to cite the cases of only two neighbouring countries—Great Britain and Germany—for a long time traditional exporters of coal, we know that the first is already among countries with a deficit in energy and that the second is about to be in the same position.

M. Le Guellec reviewed the numerous forecasts of national, international and world demand for, and supply of, energy and the impact of nuclear developments upon them. The disparity of consumption between the several countries is allied

to the disparity in resources, which determine the structure of the market for energy. 'If we take 100 as the consumption per head in Europe, the index varies from 17 to 20 for Asia and Africa to more than 300 for North America.' The price of energy depends on the costs of production and transport. The latter is valued for world trade at 10% to 15% of the price to the consumer of coal, 25% to 30% for petrol. From this is to be deduced not that petrol costs more to transport but that more of it is transported. Only 10% of coal is transported from its country of origin, while 30% to 40% of the quantity of petrol is thrown into the world market. Similar costs for electricity are limited to the cost of distribution plant and losses in transmission, while transport of gas over long distances is growing in magnitude. Owing to the very low bulk of equivalent fissionable materials, the cost of nuclear energy will be practically independent of the location of its utilisation.

What then will be the part to be played by gas in the satisfaction of these enormous demands?

The production of natural gas, practically nil at the beginning of the century and very little before 1920, now represents about one seventh of the annual production of energy in the whole world. It is mainly centred in the U.S.A. where it provides one quarter of the energy demand. Among other producers, France occupies still a modest place but developments at Lacq will place her on an equality with Italy.

On the other hand the quantities of surplus crude gas will increase in the future with the development of coke ovens and blast furnaces in the ever-growing steel industry, as well as with that of petroleum refineries with large volumes of residual gases. 'In the field of thermal utilisation, which constitutes the essential of its applications, gas meets the competition of all forms of energy, including that of its own raw materials and the by-products arising from its manufacture. But its specific advantages assure a regular growth of consumption.'

After outlining these advantages, M. Le Guellec referred to the transmission of gas over long distances, notably in the U.S.A., and discussed briefly the possibilities of transporting natural gas from the Middle East, Venezuela, and the Sahara.

Concluding, M. Le Guellec repeated that 'the next 20 years will probably be the most difficult—after that, atomic energy will bring a progressive improvement. During that time we must make the most of existing resources and the gas industry must play its great part. The growth in the consumption of energy is not only the reflection but the basis of economic development.'

ABSTRACTS FROM THE TECHNICAL COMMUNICATIONS

The Determination of Naphthalene in Distributed Gas

Having regard to the presence of other compounds forming cristalline picrates

By Louis Creusot and Guy Pommel.

OF the 300 or so substances arising in the thermal decomposition of coal, naphthalene was among the first to be identified by the chemist. It is painfully well known to the gas engineer by the trouble it gives in mains and services at the approach of winter. Hence the practical interest in the correct determination of the naphthalene content of gases to be distributed to consumers.

The problem is to determine the whole of the naphthalene and to eliminate impurities in the naphthalene determined. The most widely used of the methods of determination is that based on the formation of a compound of addition between naphthalene and picric acid. The paper consists of an examination of this method.

The authors found that at the temperatures of the laboratory only a part of the naphthalene is precipitated by washing with picric acid, but that at 0°C. it was more completely recovered with, however, a greater proportion of impurities in the form of compounds which form insoluble picrates. Two methods of removing and estimating these impurities are described and discussed in the paper. The operation consists essentially in the action of bromine on the picrate of crude naphthalene in solution, removing the 'halogenables' from precipitation.

The Study of the Plastic Stage in the Heating of Coals

Improvements in the plastometric method of Gieseler

By François Boulangier.

THE author of this paper is chief of the central coal laboratory of the collieries of the Lorraine Basin. He states that it is the report of work undertaken by the laboratory under the direction of M. E. Schwarz who died in August, 1956, and is based on notes which he left.

The Gieseler method is briefly described. A sample of the coal is placed in a metallic retort and heated up at the rate of 3°C. per minute. The retort contains a small agitator and as the coal becomes plastic the speed of the agitator, measured in degrees of arc per minute, begins to rise; it then falls as the coke begins to form. Hoehne defines a plastic zone as the interval of temperature comprised between the two temperatures corresponding to a speed of rotation of the agitator of 20° of arc per minute. In an example graph this interval lay between 419 and 488°C. It rose to a maximum well over 1,000° of arc per minute. The softening point was 377°C. and that of re-solidification 503°C.

The improvements were directed to securing a more convenient piece of apparatus and a greater degree of reproducibility in the results.

Tests on the use of Tars produced in Onia-Gegi Plants to provide Process Heat

By Guy Combarel.

AS there was no market for the tars produced in the cracking of heavy fuel oils in the Onia-Gegi plants at Cahors, it was decided to investigate the possibilities of using them for supplying process heat in the plants themselves. As a result of initial experiments, the plant was modified, in particular, by replacing the pump originally installed to supply tar to the burners by a constant head tank. Anomalies in performance and the thickening of tar led to the conclusion that the combustion chamber was too small for the use of tar in this way.

Trials with different mixtures of tars confirmed this conclusion, but indicated that the combustion of the tar was correct, regulation being effected by the constant head tank. For satisfactory operation the viscosity of the mixture, depending on temperature, its humidity, and free carbon content needed to be suitably adjusted.

Tests on the Direct Production of Distributable Gases and of Ethylenic Hydrocarbons

From light petroleum distillates by means of cyclic generators

By Jean Reboul and Guy Combarel.

THE availability of light distillates of low octane rating produced by the oil refinery industry is increasing. These distillates are relatively difficult to introduce into the cycle of preparation of finished products in great demand. A part of the quantity produced in the course of refining is used in the production of solvents, but the remaining, larger, part is only used with difficulty in the preparation of motor fuel because of its low octane rating.

It was therefore decided to ascertain whether these distillates would be useful to the gas industry in the manufacture of a gas interchangeable with town gas—they represent a high calorific value in a small volume, capable of being stocked at low cost in view of their low vapour tension. Their value as a gas containing a high proportion of ethylene and allied compounds, useful in synthesis in petrochemistry, and as a rich gas capable of transport without condensation at pressures of 18 to 20 atm. at temperatures above 5°C., was also explored.

The tests were carried out under the direction of the Department of Research and New Techniques of Gaz de France in collaboration with the Department of Production, the Shell Company and the construction companies, at Sète in the Stein and Roubaix Ms 17 plant, and in the Onia-Gegi plant at Cahors.

Two types of distillates were used, one with a sulphur content of 0.02% by weight, the other about 0.14%. The densities at 15°C. were 0.666, c.v. gross 11,265 cal. per kg., analysis, 83.3% C.; 14.2 H_2, 0.5 0_2 and difference.

The modifications and methods of operation are described.

The three objectives were satisfactorily attained with relatively simple adjustments of the plants employed. For the gas industry a supplementary link is established between butane and gas oil in the chain of products, from natural gas to heavy fuel oil, useful in the production of peak load, and even base load, gas.

The Study of High Temperature Carbonisation in 400-kg. Ovens

By Pierre Foch and Georges Meimarakis.

THE experimental station at Marienau isequipped for the study of coke production, with a battery of four normal coke ovens. It also has two semi-industrial ovens for a nominal charge of 400 kg. of coal. These enable work, similar to that in the full-scale plant, to be carried out at less expense and in a shorter time. The only serious difficulty lies in the adaptation of the thermal conditions, because while temperature is practically constant over the whole wall surface of the small oven, this is not the case with the normal coke oven. The difficulty is effectively overcome by adjusting the temperature rise in the small oven to give the same figure at the mid-height of the charge as in the normal oven.

In these conditions the same mixture in the charge yields a coke with characteristics very nearly the same in the two sizes of oven, and variations in coke quality for variations in other factors are quite analogous. It is vain to seek to obtain a perfect identity between results in the 400-kg. oven and those in the normal oven, as indeed it is between two normal batteries, say the authors. But variations of coke quality as a function of a variation in a given factor are well reproducible.

The width of the 400-kg. oven is 350 mm., but this can be modified if desired. The length between doors is 1 m. and the height of the charge is 1.05 m. Three hoppers are provided for charging by gravity.

The Determination of Sulphur in Commercial Propane and Butane

By Jacques Morlet and O. Angleraud.

THE gas industry in France is using a growing quantity of propane reformed to meet peak loads. The catalysts used are all affected by sulphur. It is therefore important that propane to be reformed, especially by continuous processes, should contain the minimum of this impurity. The object of this paper is to describe and discuss a simple and rapid method of determining sulphur content in propane delivered to the industry.

Methods previously in use have required not less than 12 hours to obtain the information. The demand in practice is for the information to be available in an hour or two.

The method here presented is directed to the determination of sulphur compounds in the gaseous state since it is only these which reach the catalysts; heavier compounds are left behind in the storage tanks or removed in earlier stages of treatment. The method consists of transforming these volatile impurities into H_2S by passing a carrier gas, diluted with hydrogen, over a platinum catalyst heated to 950° to 1,000°C. The H_2S is estimated by the colorimetric method after transformation to 'methylene blue.'

The advantages of the method are that it requires only 2 to 5 grams of the product, it can be carried out in less than two hours, it is sufficiently precise, and it permits the operator to 'see' and weigh the results.

M. Delsol, commenting on the paper, explained that this was one step only in the investigations. Other workers were engaged on the characterisation of sulphur impurities and the 'ageing' of propane stocks. The results would lead to the search for catalysts much less sensitive to sulphur. He promised new results in the near future.

Study of the Conditions of Thermal Cracking of Petroleum Oils

By Henri Dumay.

THE object of this investigation into the thermal decomposition of petroleum oils was to define the optimum conditions in the Hall plant and in the carburetted water-gas plants at Gennevilliers. The paper opens with a report of laboratory work to ascertain with precision the degree of cracking and particularly to fix the maximum efficiency. It proceeds to describe the application of these results to the two types of plant and finally to describe rapid methods of forecasting results with different fuels—the use of chromatographic methods enables results to be obtained in ten minutes.

For the Hall process maximum efficiency (calories in gas against calories in oil) are obtained with certain limits of the expression CnHm/(saturated hydrocarbons plus hydrogen), the limits with fuel oil No. 2 being 0.60 to 0.75. For CWG the characteristic expression is, CnHm/(saturated hydrocarbons plus CnHm), and the limits are 0.40 to 0.50.

Further abstracts of papers, read at the Congress will be published in a future issue.

THE CONTROL OF FLAME CHARACTERISTICS*

IN order that the rate of heat output from a burner which is fed with gas at a constant pressure, shall vary only within small limits, it is necessary to maintain the Wobbe Index $\frac{C.V.}{\sqrt{S.G.}}$ within a narrow range. In all districts of the South Eastern Gas Board where the declared calorific value is 500 B.Th.U. per cu.ft., the Wobbe Index is maintained within 700-770. For all domestic purposes and most industrial applications the control of the Wobbe Index within this range is sufficient to ensure satisfactory performance. Some industrial processes require very close control of flame characteristics if satisfactory results are to be obtained; an example is the manufacture of electric lamps.

To provide conditions suitable for the automatic manufacture of electric lamps two alternative systems can be utilised. First, the flame structure, size and intensity can be controlled so that the flames have always the same points of application. Secondly, the Wobbe Index of the mixed gas can be controlled at the factory so that the heat input to the burners is maintained within very close limits. Though the South Eastern Gas Board maintains the Wobbe Index between 700-770 it does not necessarily follow that flame characteristics remain constant. Experience has shown that flames vary and complaints have been received from firms manufacturing electric lamps in the Board's area. This complaint was investigated at the Omega Lamp Works and the results suggest that there is a solution to this problem.

At this works a Selas automatic mixing machine supplies a mixture consisting of 40% gas and 60% air at a pressure of 60 in. w.g. to a ring main feeding the automatic lamp making machines. The burners at the mixing machine are supplied with the mixture and with additional air from an air supply at 80 in. w.g., the air/mixture ratio at the burners being controlled by needle valves inserted in the air and mixture supplies. Fig. 1 is a diagram of the plant layout.

Gas supplied to the Selas machine is governed to atmospheric pressure by a governor fitted to the inlet of the proportioning valve. Air is induced through the air ports of the proportioning valve and drawn with the gas stream to the inlet of the rotary compressor. The proportioning valve is operated by the action or back pressure created by the compressor in accordance with the demand on the mixing machine so opening or closing the gas and air ports. Movement of the valve does not alter the ratio of the air port to the area of the gas port so that the air to gas ratio remains constant at all loads. The valve can be rotated about a vertical axis to alter the air to gas ratio of the mixture supplied.

Before the Board was consulted it was the practice to adjust the proportioning valve of the Selas machine to give a mixture which, when burnt in a small test burner, gave a flame of the correct cone height. Once the mixture composition was set, the lamp-making machines operated satisfactorily until the gas characteristics changed. After a large change, wastage became very high until the mixture composition was re-adjusted and the test flame restored to its original height. Manual adjustment was not a satisfactory method of continuous control and alternative solutions were investigated.

Installation I

The layout of the installation was as shown in Figure 2. The air-gas ratio of the mixture was controlled to give a constant cone height by varying the outlet pressure from the gas governor at the inlet to the gas-air proportioning valve, so increasing or decreasing the gas input to the mixture. The governor was converted from atmospheric loading to gas loading, the loading pressure being regulated by the thermostatic controlling device shown. The controller consisted of a thermostat, the tip of which was inserted in the flame cone of a special burner supplied with the mixture from the outlet of the Selas machine. Alterations in the cone height of the flame varied the temperature of the thermostat tip and hence the position of the thermostat valve.

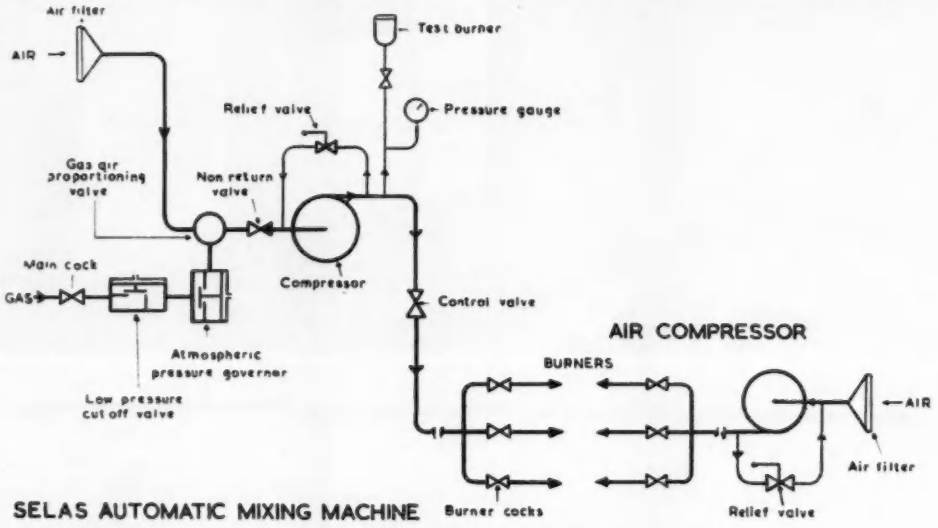


Fig. 1. Diagram of plant.

Gas for loading the governor was supplied, through a needle valve, from the inlet side of the gas governor so that an alteration in the position of the thermostat valve increased or decreased the loading pressure. Changes in the loading pressure resulted in changes in the gas input, so restoring the cone height to its original value. The loading pressure was limited by means of a water seal connected across the thermostat. The outlet of the water seal and the outlet from the thermostat were connected to a weep burner.

Improved operation was obtained with this installation but difficulties were encountered because the range of control of the air-gas mixture was insufficient to compensate for all variations in gas characteristics. The installation had proved the validity of the method and the results were used to design an improved system.

Installation II

To compensate for a wider range of gas characteristics than was possible by the method used in the first installation, compressed air at 60 in. w.g. was used to operate a bellows-controlled butterfly valve installed in the air supply to the proportioning valve of the Selas machine. As shown in Fig. 3 the thermostat controller was again used as the detecting element. Changes in the cone height of the test flame caused

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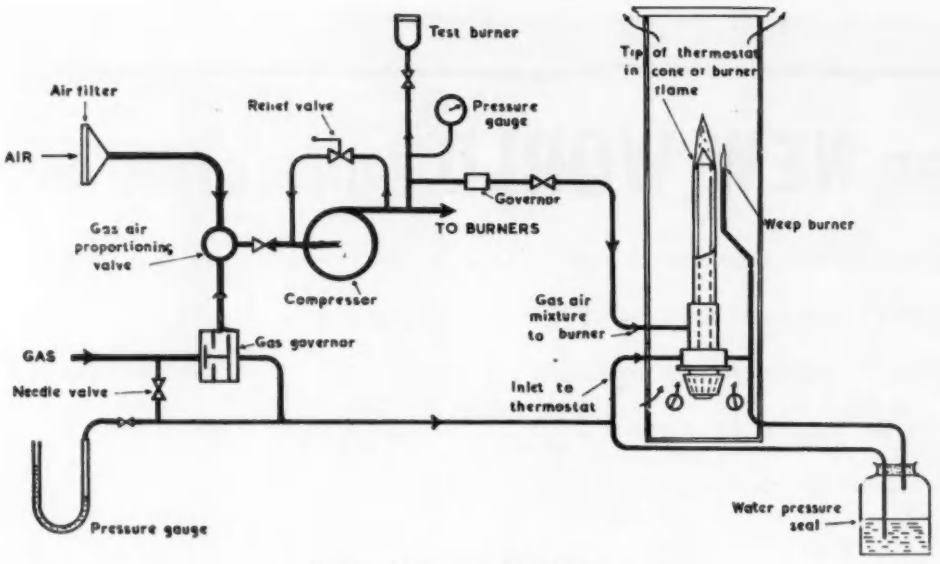

Fig. 2. Diagram of Installation I.

alterations in the position of the butterfly valve so increasing or decreasing the air input to restore the original cone height.

To enable the ratio of temperature change in the flame to air pressure change at the butterfly valve bellows to be adjusted as required, a linkage device was installed. The device consisted of a lever fitted with a movable fulcrum. Attached to one end of the lever were small bellows that expanded or contracted in accordance with the back pressure created by the thermostat controller. The other end of the lever controlled a valve fitted in the weep line from the butterfly valve bellows. Movements of the small bellows were transmitted by the lever to the valve so increasing or decreasing the air pressure in the butterfly valve bellows. Adjustment of the movable fulcrum altered the ratio of the movement of the small bellows to the movement of the valve, thus effectively altering the ratio of temperature change to pressure change. The system was reasonably satisfactory but it was found that a simple proportional controller was unable to compensate for all the variations in gas characteristics and load that arose.

Further difficulty was caused by the use of the butterfly valve. Normally the Selas machine compensated for load changes by alterations in the position of the proportioning valve, and since the air and gas ports closed or opened by the same percentage, the mixture remained constant for all loads. The butterfly valve, however, acted as a restrictor in the air supply so that the air pressure at the proportioning valve varied below atmospheric pressure according to the position of the butterfly valve and the demand upon the Selas machine. The addition of the butterfly valve, therefore, gave rise to mixture variations with load changes. It was found that variations in gas characteristics could be compensated for, but load changes gave rise to discrepancies of considerable magnitude.

The installation led to the further conclusion that thermostats were not sufficiently reliable for long uninterrupted running at the relatively high pressure employed. The experience gained was used in the design of the third installation which proved satisfactory under operating conditions.

Installation III

The temperature in the flame was measured by a thermocouple, as shown by Fig. 4. Initially, a 'Pyrotenax' couple was used but difficulty was experienced due to random fluctuations in temperature. Such fluctuations gave unsatisfactory control, so a heavier gauge 'Pyrotenax' couple was substituted with a metal thimble welded to its tip. Tests showed that the random fluctuations were entirely eliminated by the increased thermal capacity but that the speed of response was well maintained.

A mechanical potentiometer was selected to measure the

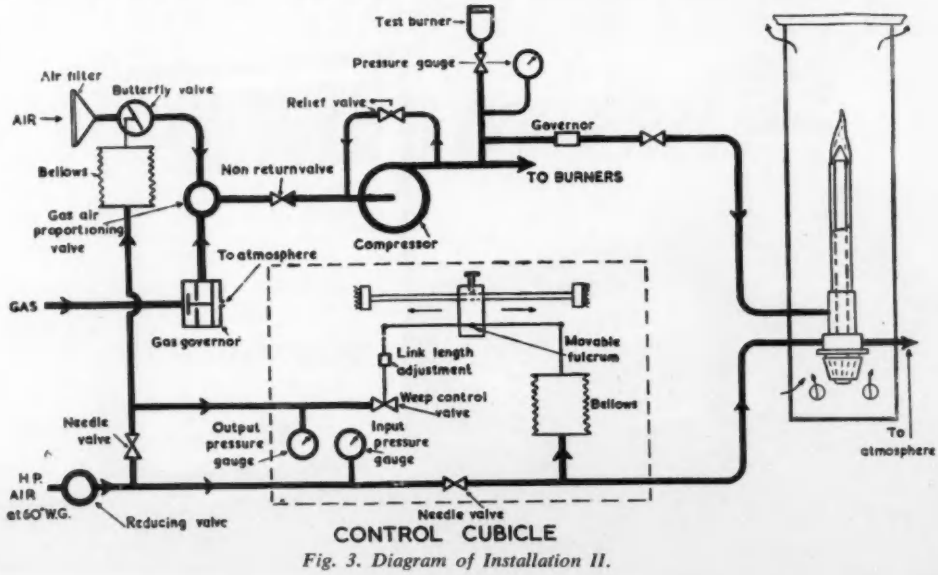

Fig. 3. Diagram of Installation II.

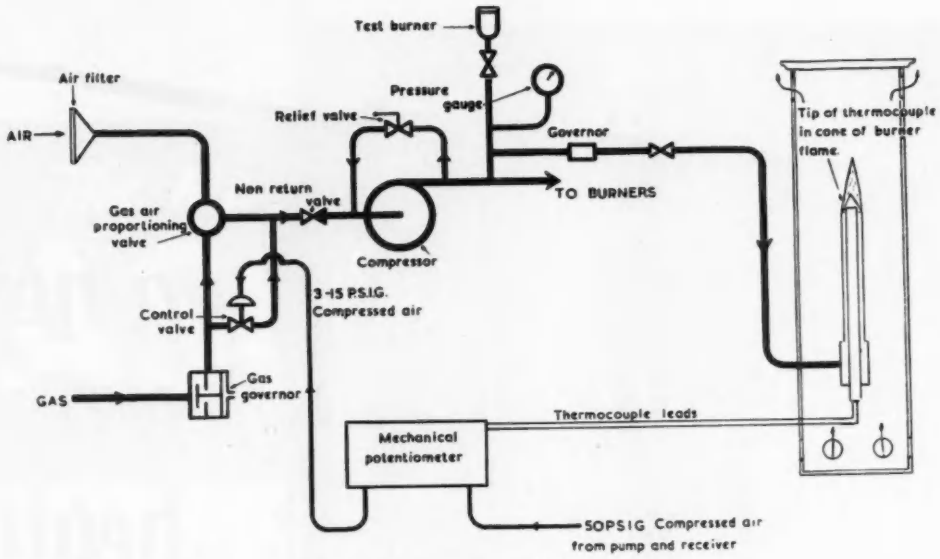

Fig. 4. Diagram of Installation III.

millivolt output from the thermocouple and to use it to operate a pneumatic three-term controller. Variations in flame characteristics were then measured as temperature changes and an output signal varying between 3 and 15 lb. per sq. in. was obtained. Fig. 5 shows the mechanical potentiometer; the air compressor and receiver are also shown.

As shown in Fig. 4 a control valve actuated by the air pressure signal from the mechanical potentiometer was installed between the outlet of the gas governor and the inlet of the compressor. It was found necessary to use a control valve having a ½ in. port and to connect up with 1 in. copper pipe. Under these conditions the suction on the inlet to compressor was approximately 2½ in. w.g. and a maximum gas flow of approximately 400 cu.ft. per hour was obtained through the control valve. The total gas flow through the proportioning valve was 1,200 cu.ft. per hour so that interaction between the two flow channels was kept to a minimum.

It was found possible to maintain the height of the inner cone on the test flame to within ±1/50th in.

Control of Wobbe Index

An alternative approach to the problem is to control the Wobbe Index of the air-gas mixture within narrow limits. To complete the investigation, this method was also used, the pneumatically operated valve of Installation III being well suited to the purpose. The air-gas mixture previously used to feed the control burner was utilised to feed a Sigma-Kent Wobbe Index controller. Figs. 6 and 7 show the installation.

The Sigma-Kent Wobbe Index controller consists of the Sigma Instrument Company's Wobbe Index recorder fitted with a Kent Mark 20 pneumatic controller. Gas is fed to a precision governor which maintains the pressure constant within very fine limits. The governed gas then passes to a burner through an orifice so that the rate of gas flow is inversely proportional to the square root of the specific gravity. The burner is situated at the base of a vertical metal cylinder which expands with temperature rise, the mechanical movement being made to actuate a pen, by means of a mechanical linkage system. The pen deflection is therefore proportional not only to calorific value but also to the reciprocal of the square root of the specific gravity, i.e., the Wobbe Index. For control purposes the pen is made to actuate the 'flapper' of a Kent Mark 20 pneumatic controller which converts the mechanical movements of the pen into a corresponding change in air pressure within the range 3-15 lb. per sq. in.

The Wobbe Index controller is now commercially available in a variety of ranges, the one selected being 170-250. The controller maintains the Wobbe Index of the air-gas mixture at a chosen figure (approximately 200) within ±1% independent of the characteristics of the incoming gas. The installation has now given trouble-free service for a period of six months.

Two alternative control installations have been tested and their relative merits can be assessed by the performance of two machines used in the manufacturing process: The footmaking machine which seals the supporting wires into their glass holder and the sealing machine which seals off the base of the completed lamp. It is found that both flame characteristics control and Wobbe Index control give equivalent results in performance of the footmaking machine but that Wobbe Index control gives very much better results on the sealing machine. For this particular installation therefore a better overall performance is obtained using the Wobbe Index controller.

During the present period of operation glass wastage has been reduced to about a quarter of the wastage experienced

Fig. 5.

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The 'Jason' has been designed to provide an inexpensive bath water heater which is easy to install, simple to use and to maintain. An instantaneous heater, it has an output of 1.18 gallons per minute raised 80°F, or an increased output of up to 2½ gallons per minute at lower temperatures. The heater can be fitted with a swivel spout for dual service to bath and wash basin, or with a short stub spout for bath supply only. The pilot, gas and water taps are interlocking. Water supply may be from storage tank or direct from the mains.

The heater is of strong durable construction — finished in white vitreous enamel externally with the top cover and base of aluminium. Tap handles are black plastic.

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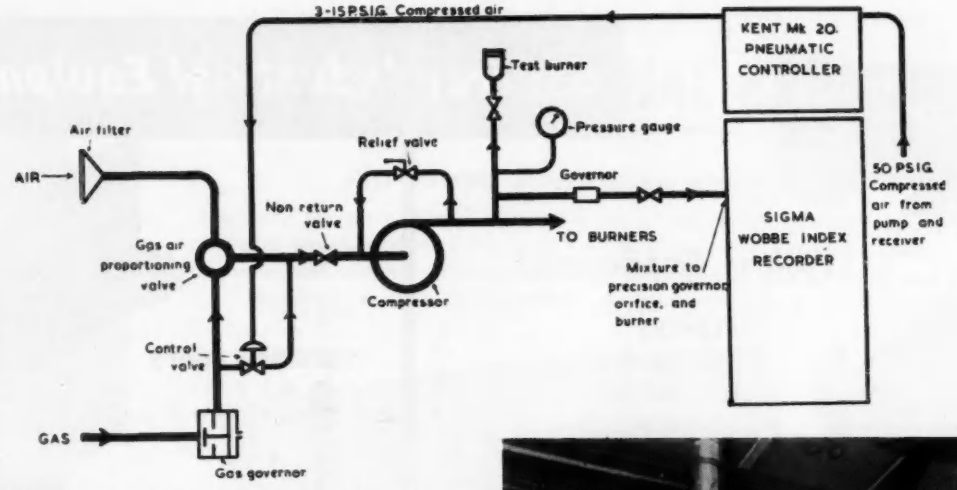
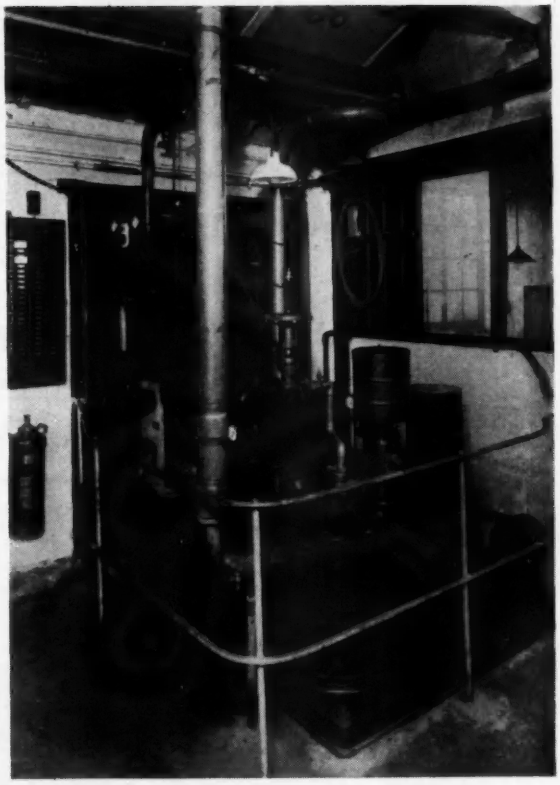


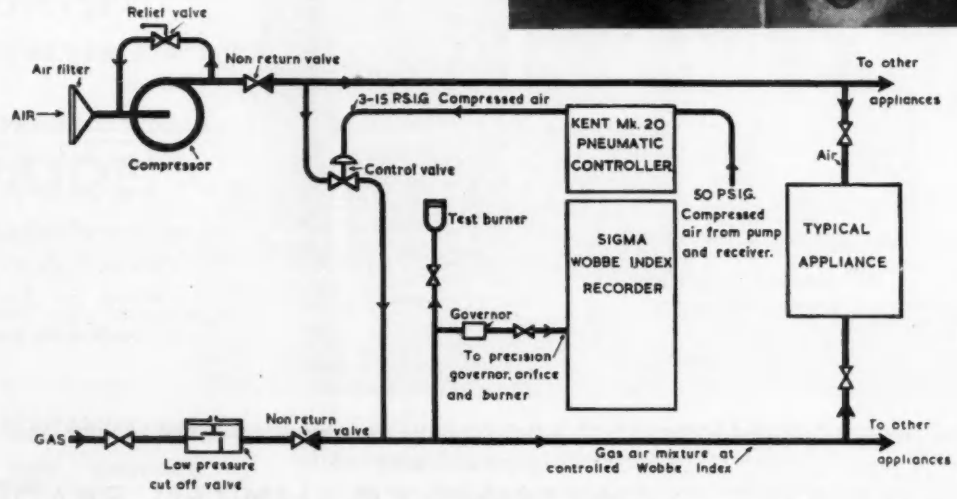


Above: Fig. 6—Diagram of Wobbe Index Control. Right: Fig. 7. Below: Diagram of layout with air compressor only.

before the installation was put to work, and the production time lost due to unsatisfactory operation of the machines has been considerably reduced. It is of interest that the performance was in no way impaired during a period when the atmospheric temperature fell to 19°F., and the maintenance of a gas supply was a matter of grave anxiety.

Each installation has received an extended test over a period of six months without requiring attention but the nature of the equipment is such that in a permanent installation a regular six-monthly overhaul should be carried out by a competent instrument mechanic to provide preventative maintenance and reduce the incidence of failures.

The investigation has led to a satisfactory solution to the problem at this works. Similar control systems would probably be satisfactory whenever problems of this type arise provided that the capacity of the plant is adequate and that the equipment is well maintained. In factories where mixing machines are not employed, the gas being fed direct to the burners of the lamp making machines, a small volume of air, controlled by either instrument could be added to the gas to produce a gas of constant gas burning characteristics, or of constant Wobbe Index. The quantity of air added would be small, being sufficient to reduce the Wobbe Index of any incoming gas to the lowest Wobbe Index which could be reasonably expected. An installation of this type is illustrated in Fig. 8.



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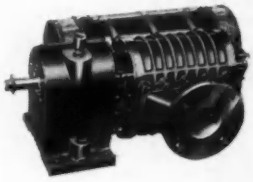

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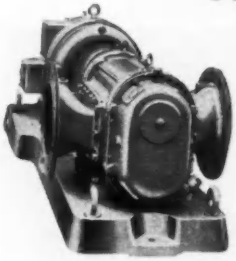

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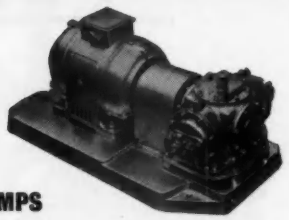

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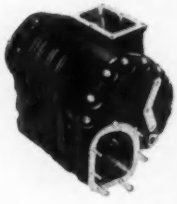

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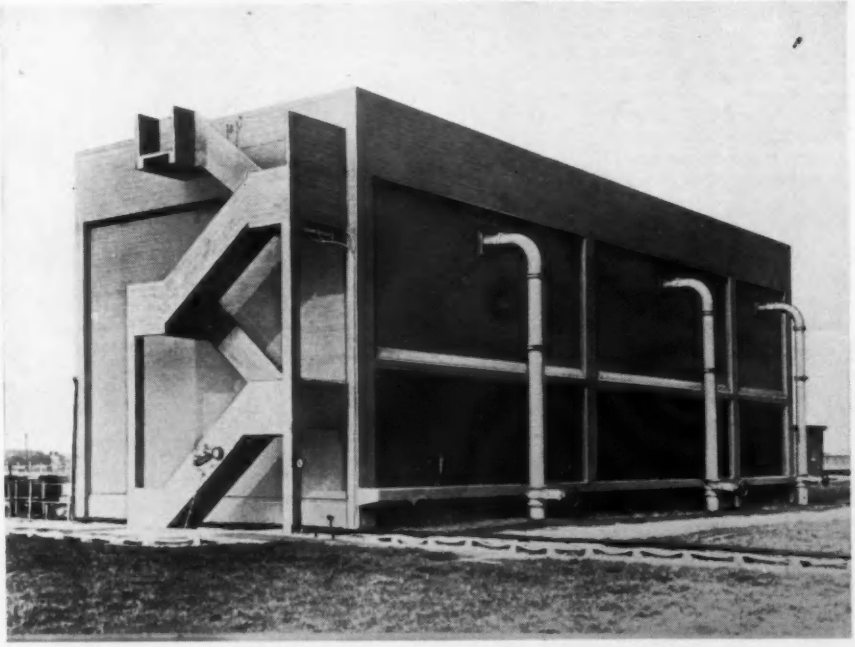

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(*Classified advertisements continued on page* 394)

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APPLICATIONS are invited from suitably qualified persons for the above position.

The successful applicant will be responsible to the Matlock District Manager for Sales and Service and general administration, and to the District Distribution Engineer for emergency and day-to-day distribution work.

He will also be required to undertake certain supervisory duties in respect of the intake of purified gas and the control of the gasholders.

The successful candidate will be required to find his own accommodation, as there is no Board's house available in the District.

The salary for this position will be within Grades A.P.T. 6/7 (£640/£785), and placing thereon will be in accordance with qualifications and ability.

The position is pensionable and the successful applicant will be required to pass a medical examination.

Applications, with full details of education, qualifications and experience, together with the names and addresses of two referees, should be addressed to the undersigned at Commercial Street, Sheffield, 1, and should be forwarded to reach him not later than Wednesday, September 4, 1957.

C. C. WOOD,
Divisional General Manager.

Commercial Street,
Sheffield, 1.

EAST MIDLANDS GAS BOARD

LINCOLNSHIRE DIVISION
VACANCIES FOR TECHNICAL ASSISTANTS—GAINSBOROUGH GROUP—GRIMSBY GROUP—LINCOLN GROUP.

APPLICATIONS are invited from suitably qualified persons for the post of TECHNICAL ASSISTANT at the above Groups. The commencing salary will be within Grades A.P.T. 5/6/7 (£605/£785 p.a.) according to age, qualifications and experience.

Applicants should preferably be in possession of, or studying for, the Institution of Gas Engineers Higher Grade Certificate in Gas Manufacture, or equivalent qualifications. They should also have had practical experience on a modern gasworks, with special reference to continuous vertical retort practice and auxiliary carburetted water gas plant.

The positions are pensionable and the successful applicants will be required to pass a medical examination.

Applications, giving details of age, education, training qualifications and experience, together with the names of two referees should be addressed to reach the undersigned by not later than September 7, 1957.

BERNARD CLARKE,
Divisional General Manager.

Belle Vue House,
Carline Road,
Lincoln.

August 16, 1957.

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The successful candidate will be responsible to the Group Production Engineer for production of gas and coke at Dunfermline Undertaking. Applicants should be experienced in operation of continuous vertical retorts and C.W.G. Plant. Salary scale A.P.T. 8, £745-£825 per annum.

2. WORKS SUPERINTENDENTS — ALLOA, STIRLING, KIRKCALDY.

A WORKS SUPERINTENDENT is required for each of the above Undertakings. Successful applicants will be responsible to respective Group Production Engineers for production of gas and coke in Works under their control. Applicants should be experienced in operation of continuous vertical retorts and C.W.G. Plants. Salary Scale A.P.T. 7, £705-£785 per annum.

The persons appointed will be the senior member of Technical Staff in each of the Works, and should hold a recognised qualification of the Institution of Gas Engineers.

The commencing salary in each case will be dependent on qualifications and experience.

The above posts are pensionable and successful applicants will be required to pass medical examinations.

Applications, stating age, and giving particulars of education, training, experience and qualifications, together with names of two referees, should be addressed to General Manager, Central Division, Scottish Gas Board, Gas Works, Friarton, Perth, within 14 days of the appearance of this advertisement.

NORTH WESTERN GAS BOARD

APPLICATIONS are invited for the following pensionable appointments:—

LIVERPOOL GROUP
ASSISTANT INSTALLATIONS OFFICER

(Salary within Grades A.P.T. 11/12—£895/£1,070 p.a.)

Applicants should have had a wide practical experience of the installation and maintenance of all types of gas burning appliances. Preference will be given to applicants holding the City and Guilds Final Gasfitting Certificate and the Higher Grade Certificate in Gasfitting (Supply) or its equivalent.

Application should be made on the official form obtainable by writing to the Chief Personnel Officer, Liverpool Group, N.W.G.B., Radiant House, Bold Street, Liverpool 1, and returned to him within 14 days.

MID-CHESHIRE GROUP
CHEMIST—CREWE WORKS

(Salary within Grade A.P.T. 7—£705/£785 p.a.)

Applicants must be experienced in the carrying out of routine laboratory tests and be able to exercise chemical control of gas manufacturing and product processes. They should possess suitable technical qualifications, and gas works experience would be an advantage.

Detailed applications, including particulars of present appointment and the names of two referees, should be sent to the General Manager, Mid-Cheshire Group, N.W.G.B., Hartford Manor, Greenbank, Northwich, within 14 days.

SOUTHERN GAS BOARD

DISTRIBUTION ENGINEER—READING REGION

APPLICATIONS are invited from suitably qualified persons for the post of DISTRIBUTION ENGINEER in the Reading Region of the Southern Gas Board.

The successful candidate will be responsible to the Board's Distribution Engineer for gas distribution throughout the Region through low, medium and high pressure systems.

The post will be based on Reading, and it would be appropriate for the Regional Distribution Engineer to live in the vicinity.

The salary will be by arrangement but not less than £1,595 per annum. The successful candidate will be required to pass a medical examination and unless already subject to a pension scheme by virtue of the Gas (Pension Rights) Regulations, 1950, will be required to join the Board's Staff Pension Scheme.

Applications must be on the form provided which may be obtained from the Personnel Manager of the Southern Gas Board, 164, Above Bar, Southampton. Forms should be returned to him in an envelope marked "Regional Distribution Engineer," not later than September 12, 1957.

CARMARTHENSHIRE EDUCATION COMMITTEE

LLANELLY TECHNICAL COLLEGE—PIBWRLWYD RURAL TECHNICAL COLLEGE

APPLICATIONS are invited for the post of full-time Assistant Master in Gas Fitting (Theory and Practice) for divided service between Llanelly and Pibwrlwyd Technical Colleges.

Candidates should possess the full City and Guilds of London Institute Technological Certificate in Gas Fitting or equivalent qualifications with suitable industrial experience. Ability to assist with the teaching of Plumbing will be an added recommendation.

Salary in accordance with the Burnham Further Education Report, 1956, for Grade A Assistant (£475 × £25 — £900) plus allowances for degree, approved training and industrial experience.

Duties to commence on January 1, 1958.

Forms of application, which must be returned within two weeks of the appearance of this advertisement, may be obtained from the undersigned on receipt of a stamped addressed envelope.

IORWERTH HOWELLS,
Director of Education.

County Education Offices,
County Hall,
Carmarthen.

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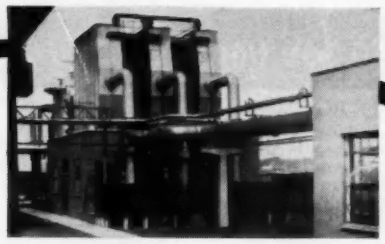
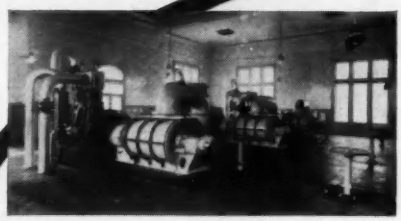


CONDENSERS



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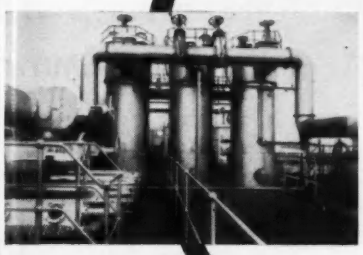

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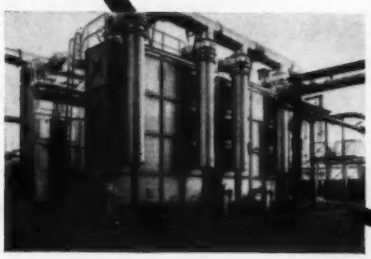

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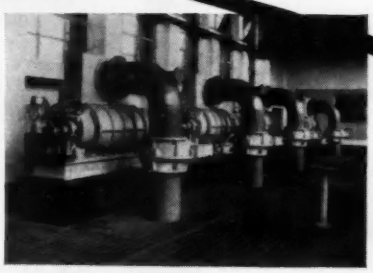

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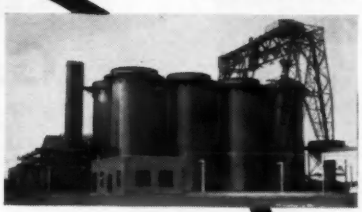

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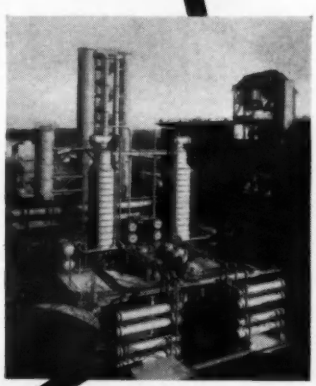
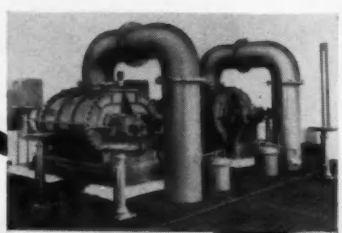


BENZOLE RECOVERY PLANT



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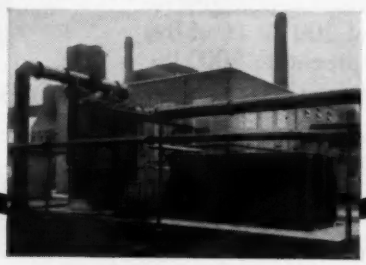

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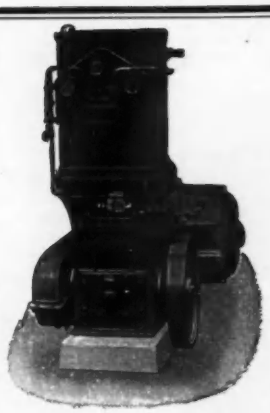
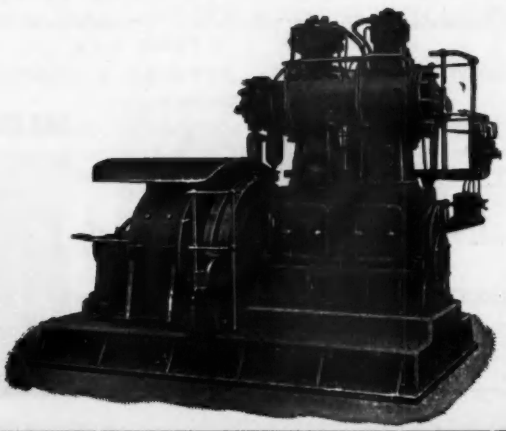


HIGH PRESSURE GAS COMPRESSORS *for pressures up to 5,000 lbs. per sq. in.*

The illustrations show two high pressure gas compressors. As specialists in the design and manufacture of compressors for both air and gases, we make compressors for a wide range of capacity and pressure up to 5000 lbs. per sq. inch.

The compressor shown above has a capacity of 25 cu. ft. of free hydrogen per minute compressed to 3000 lbs./sq. inch. The illustration on the right shows a four-stage compressor with a delivered capacity of 200 cu. ft. of free town's gas per minute compressed to 5000 lbs. per sq. inch.



For full information regarding gas compressors, write, giving particulars of the duty required, to—

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PL 2

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Left:—ST. ALBANS. Foundation work for a new installation of 64 Glover-West continuous vertical retorts. 260 West's Shell Piles, 17½" dia., varying between 8 ft and 61 ft long, were driven to support the carbonizing and coal and coke handling plants. Loads carried are up to 60 tons per pile.

(Photo by courtesy of the Eastern Gas Board)

Right:—DENTON. Two of the retort benches and the mechanical producers in this installation of 160 Glover-West continuous vertical retorts are supported on West's Shell Piles, a total of 409 piles, 17½" dia., having been driven to depths varying between 15 ft and 30 ft.

(Photo by courtesy of the North Western Gas Board)

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